BUBBLE FORMATION;
A BIBLIOGRAPHY

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FORWARD

Bubble phenomena have been given a new meaning with their study in relation to the kinetic behavior of reactors. Prior to their study in relation to physics, the bulk of work on bubble phenomena concerned naval engineering problems of behavior in cavitation and water entry behavior. This bibliography, we hope, will fill the need of the reactor physicist as well as the naval engineer.

An attempt has been made to include all available references on bubble phenomena and associated effects.

A subject index has been purposely omitted. It is felt that the breakdown in content headings is sufficient to ascertain areas of interest. There will be overlapping of headings and to find all possible entries, a search through the headings may be desirable. Further, to increase the usefulness of this bibliography the location of an abstract has been cited wherever possible following the reference.

Included in this bibliography are reports that are classified. However, the titles of these reports do not contain any classified information.

Sources used in compiling this bibliography are: Chemical Abstracts, Industrial Arts Index, Applied Mechanics Review, Nuclear Science Abstracts, the AEC Abstracts of Classified Literature, the AEC card catalogs available at Atomics International, and the bibliographic services of Armed Services Technical Information agency.

Abstract Abbreviations

Eng Ind - Engineering Index

App Mech Rev - Applied Mechanic Reviews

CA - Chemical Abstracts

NSA - Nuclear Science Abstract

Sci A - Science Abstracts

I. BUBBLES

AERATION

1. P. D. Haney, "Theoretical Principles of Aeration," J. Am. Water Works Assoc. 46, 353-76 (1954), Abst. CA-48-6624b.
2. R. E. Pattle, "The Aeration of Liquids. I. Solution of Gas from Rising Air Bubbles. II. Factors in the Production of Small Bubbles," Trans Inst. Chem. Engrs. (London) Advance Copy, 17-27 (Feb. 14, 1950), Abst. CA-44-4728i.
3. E. R. Stapley, "Some Aspects of Filtration - Plant Design and Operation," Southwest Water Works J. 24, No. 11, 14-16 (1943), Abst. CA-37-2852-9.

ATTACHED PARTICLES

4. G. Astre, "Deposits of NaHCO_3 on Gas Bubbles in the Water of Boulou," Bull. sci. pharmacol. 49, 93-7 (1942), Abst. CA-38-5622-9.
5. O. S. Bogdanov and M. Sh. Filanovskii, "Adhesion of Mineral Particles to Air Bubbles," J. Phys. Chem. (U.S.S.R.) 14, 244-7 (1940), Abst. CA-36-3721-3.
6. P. K. Deshpande and G. N. Bhat, "Bubble - Pick-Up Studies with Alumina," J. Indian Inst. Sci., 37A, 141-6 (1955), Abst. CA-49-12083b.
7. M. A. Engeles, "Kinetics of Mineralization of Air Bubbles in Flotation Suspensions," Tsvetnye Metal. No. 2, 39-45 (1940), Abst. CA-35-17-4.
8. L. F. Evans, "Bubble Mineral Attachment in Flotation," Ind. Eng. Chem. 46, 2420-4 (Nov. 1954), Abst. NSA-9-148.
9. V. A. Glembotskii, "Rate of Adhesion of Air-Bubbles to Mineral Particles During Flotation, and Methods of its Measurement," Izvest. Akad. Nauk. S.S.S.R., Otdel. Tekh. Nauk., 1524-31 (1953), Abst. CA-49-6667d.
10. I. N. Plaksin and S. V. Bessonov, "The Adherence of Sulfide Minerals to Air Bubbles in the Absence of Reagents," Doklady. Akad. Nauk. S.S.S.R., 97, 495-8 (1954), Abst. CA-49-12083c.
11. Z. V. Volkova, "The Adherence of Mineral Particles to the Surface of Air Bubbles During Flotation," J. Phys. Chem. (U.S.S.R.) 14, 789-800 (1940), Abst. CA-37-2977-6.

BURSTING

12. T. Alty, "Some Phenomena Occurring at the Surface of Bubbles in Water," Proc. Roy. Soc. (London) 110A, 178-90 (1926), Abst. CA-2605-5.
13. D. C. Blanchard and D. M. Newitt, "Bursting of Bubbles at an Air-Water Interface," Nature 173, 1048-9 (1954), Abst. Sci A-57-8085.
14. F. H. Constable and S. Baykut, "The Life of Single Bubbles on Water," Rev. fac. sci. univ. Istanbul A17, 309-21 (1952), Abst. Sci A-57-5334.
15. L. Facy, "Bursting of Thin Films and Condensation Nuclei," J. sci. meteorol. 3, 86-98 (July-Sept. 1951), Abst. Sci A-56-7355.
16. F. Knelman et al, "Mechanism of the Bursting of Bubbles," Nature 173, 261 (1954), Abst. Sci A-57-5335.
17. M. Kornfeld, "How Does a Soap Bubble Burst?" Zh. Tekh. Fiz. 24, No. 8, 1520 (Aug. 1954), Abst. App Mech Rev-8-3448.
18. B. J. Mason, "Bursting of Air Bubbles at the Surface of Sea Water," Nature 174, 470-1 (1954), Abst. Sci A-58-105.
19. A. H. Woodcock, "Bursting Bubbles and Air Pollution," AD-88692b (1955).
20. A. H. Woodcock et al, "Giant Condensation Nuclei from Bursting Bubbles," Nature 172, 1144-5 (1953), Abst. Sci A-57-2954.

CAVITATION

21. J. Ackeret, "Experimental and Theoretical Investigations of Cavitation in Water," [(Trans. from Eidgenössischen Tech., Hoch. Zurich, (1930)) NACA-TM-1078, Abst. NSA-9-6249.
22. A. J. Acosta, "Cavitation in Axial Flow Pumps," AD-99273 (1956).
23. E. Crewdson, "Cavitation," Engineer 195, No. 4954, 122-3 (1953).
24. P. Eisenberg, "Discussions and Author's Closure for a Brief Survey of Progress on the Mechanics of Cavitation," DTMB-842 A (1953).
25. N. M. Eskigian, "A Model Study of the Fluid Flow at the Rudder Stock of a Surface Ship." AD-111735 (1956).
26. R. M. Fryar, "Summary of Present Status and Future Program of Cavitation Problem." HW-25837.

27. Great Britain National Physical Laboratory, "Symposium on Cavitation in Hydrodynamics," (London) H. M. Stationery Office (1956), Abst. App Mech Rev-8-155.
28. E. N. Harvey et al, "On Cavity Formation in Water," J. Appl. Phys. 18, 162-172 (1947).
29. R. W. Kermeen and J. T. McGraw, "Mechanism of Cavitation Inception and Related Scale-Effects Problem," Trans. Am. Soc. Mech. Engrs. 77, 533 (1955).
30. R. T. Knapp and A. Hollander, "Laboratory Investigations of the Mechanism of Cavitation," Trans. Am. Soc. Mech. Engrs. 70, 419 (1948). Abst. Eng Ind-1948-p.198.
31. R. M. Olson, "Cavitation Testing in Water Tunnels." AD-54981 (1954).
32. B. R. Parkin, "Scale Effects in Cavitating Flow." AD-15861 (1952).
33. D. C. Pease and L. R. Blinks, "Cavitation from Solid Surfaces in the Absence of Gas Nuclei," J. Phys. & Colloid Chem. 51, 556-67 (1947), Abst. CA-41-3673g.
34. M. D. Rosenberg, "Gaseous-type Cavitation in Liquids," AD-34119 (1953).
35. M. W. Self and J. F. Ripken, "Steady-state Cavity Studies in A Free-jet Water Tunnel." AD-71800 (1955).
36. K. K. Shalnev, "Criterion for the Incidence of Break-away Cavitation on a Cylindrical Profile," [Trans. from Doklady Akad. Nauk. S.S.S.R. 61, 799-802 (1948)], AEC-TR-2094, Abst. NSA-9-3127.
37. K. K. Shalnev, "The Kinematic Structure of Break-away Cavitation on a Circular Profile," [Trans. from Doklady Akad. Nauk. S.S.S.R. 97, 785-8 (1954)], AEC-TR-2098, Abst. NSA-9-3217.
38. K. K. Shalnev, "Shapes of the Cavitation Region on a Transverse Foil in a Normally Incident Stream," [Trans. from Doklady Akad. Nauk. S.S.S.R. 94, 1017-22 (1954)], AEC-TR-2096, Abst. NSA-93128.
39. K. K. Shalnev, "Structure of the Cavitation Region," Izvest. Akad. Nauk. S.S.S.R. Otdel. Tekh. Nauk., No. 5, 119-46 (1954).
40. J. G. Waugh, "Water-entry Pitch Modeling with One-to-one Froude and Cavitation Number Scaling," AD-100890 (1955).

COLLAPSE

41. A. T. Ellis, "Observations on Cavitation Bubble Collapse, " AD-7615 (1952).
42. R. H. Mellen, "An Experimental Study of the Collapse of a Spherical Cavity in Water, " J. Acoust. Soc. Am. 28, No. 3, 447-54 (1956), Abst. Sci A-59-4860.
43. H. Povitsky, "The Collapse or Growth of a Spherical Bubble on Cavity in a Viscous Fluid, " Proc. First U.S. Nat. Congr. Appl. Mech. June 1951, 813-821 (1952), Abst. App Mech Rev-7-3623.
44. R. Lord, "Pressure Developed in a Liquid During the Collapse of a Spherical Cavity, " Phil. Mag. 34, 94 (1917).
45. K. K. Shalnev, "Pressure and Erosion in the Region of Collapse Cavitation of Circular Cross Section, " Izvest. Akad. Nauk. S.S.S.R. Otdel. Tekh. Nauk., No. 6, 111-20 (1954).
46. L. Trilling, "The Collapse and Rebound of a Gas Bubble, " J. Appl. Phys. 23, 14-7 (Jan. 1952), Abst. Sci A-55-2466.

DAMPING, OSCILLATING, VIBRATING

47. D. C. Campbell, "Motions of a Pulsating Gas Globe Under Water; A Photographic Study. " DTMB-512 (1943).
48. G. Chertock, "The Flexural Response of A Submerged Solid to a Pulsating Gas Bubble, " J. Appl. Phys. 24, 192-7 (Feb. 1953), Abst. Sci A-56-3033.
49. M. L. Exner and W. Hampe, "Experimental Determination of the Damping of Pulsating Air Bubbles in Water, " Acustica 3, No. 2, 67-72 (1953), Abst. Sci A-57-2173.
50. M. L. Exner and W. Hampe, "Experimental Determination of the Damping of Pulsating Air Bubbles in Water, " Acustica 4, 450 (1954).
51. M. L. Exner, "Measurement of the Damping of Oscillating Air Bubbles in Water, " Akust. Beih. No. 1, AB-25-AB-33 (1951), Abst. Sci A-55-1583.
52. H. Lauer, "On the Thermal Damping of Bubbles of Various Gases in Water, " Akust. Beih. No. 1, AB-12-AB-24 (1951), Abst. Sci A-55-1582.
53. E. Meyer and K. Tamm, "Characteristic Vibration and Damping of Gas Bubbles in Liquids, " Akust. Z. 4, 145-52 (1935), Abst. CA-35-4257-9.

54. E. Meyer and K. Tamm, "Natural Vibration and Damping of Gas Bubbles in Liquids," [Trans. from Akust. Z. 4, No. 3 (May, 1939),] DTMB-T-109.
55. R. H. Pennington, "Surface Instabilities on Pulsating Gas Bubbles," AD-32031 (1954).
56. H. Pfriem, "On Thermal Damping in Spherically Symmetric Vibrating Gas Bubbles," [Trans. from Akust. Z. 5, 202-12 (July, 1940),] DTMB-T-158.
57. M. Strasberg, "Damping of Pulsating Air Bubbles in Water," Acustica 4., No. 4, 450 (1954), Abst. Sci A-58-141.
58. M. Strasberg, "The Pulsation Frequency of Nonspherical Gas Bubbles in Liquids," J. Acoust. Soc. Amer. 25, 536-7 (May, 1953), Abst. Sci A-56-5325.

DENSITY EFFECTS

59. L. S. Akeselrod and V. V. Dilman, "Specific Gravity of a Bubbling Gas-Liquid Mixture," Kim. Prom. No. 1, 28-33 (1954), Abst. CA-48-13306f.
60. W. H. Cook, "Boiling Density in Vertical Rectangular Multichannel Sections with Natural Circulation," ANL-5621 (1956).
61. D. English, P. T. Blacker, and W. E. Simmons, "Boiling and Density Studies at Atmospheric Pressure," AERE-ED/M-20 (1955).
62. M. L. Greenfield et al, "Studies on Density Transients in Volume-heated Boiling Systems," AECU-2950 (1954), Abst. NSA-9-936.
63. W. L. Martin et al, "Density Transients in Boiling Liquid Systems Interim Report," AECU-2169 (July, 1952).

DYNAMICS

64. L. S. Akselrod and V. V. Dilman, "Bubble Characteristics at Low Gas Velocities," Zhur. Priklad. Khim. 27, 485-92 (1954), CA-48-11148b.
65. S. G. Bankoff, W. J. Colahan, and D. R. Baitz, "Summary of Conference on Bubble Dynamics and Boiling Heat Transfer Held at the Jet Propulsion Laboratory, June 14 and 15, 1956," AD-118586, also as JPL-MEMO-20-137 (Dec. 10, 1956).

66. R. Becker and W. Doring, "The Kinetic Treatment of Nuclear Formation in Supersaturated Vapors," Ann. phys. 24, (Ser.5), 719-752 (1935), Abst. CA-30-1641.
67. W. D. Chesterman, "The Dynamics of Small Transient Cavities," Proc. Phys. Soc. (London) 65B, Part II, 395B, 846-858 (Nov. 1952), Abst. App Mech Rev-6-1986.
68. J. A. Clark, "The Thermodynamics of Bubbles," AD-108762 (1956).
69. H. K. Forster, "Conduction of Heat Into a Growing Vapor Bubble," J. Appl. Phys. 25, 1067-8 (1954), Abst. CA-48-12479c.
70. H. K. Forster and N. Zuber, "Dynamics of Vapor Bubbles and Boiling Heat Transfer," A.I. Ch. E. Journal 1, 531-5 (Dec. 1955), NSA-10-2698.
71. H. K. Forster and N. Zuber, "Dynamics of Vapor Bubbles and Boiling Heat Transfer," Conference on Nuclear Engineering, Univ. Calif., L. A. (1955).
72. W. L. Martin, "Transient Behavior of Bubbles," CF-52-4-197 (1952).
73. M. S. Plesset, "The Dynamics of Cavitation Bubbles," J. Appl. Mech. 16, 277-82 (1949), Abst. App Mech Rev-3-2697.
74. M. Rattray, "Perturbation Effects in Cavitation Bubble Dynamics," Thesis, Calif. Inst. of Tech. (Pasadena, Calif.) (1951).
75. M. Volmer, Kinetik der Phasenbildung, (Leipzig) Steinkopf (1939), Abst. CA-33-5276-6.
76. S. A. Zwick and M. S. Plesset, "Note on the Dynamics of Small Vapor Bubbles in Liquids," AD-40932 (Feb. 1954).
77. S. A. Zwick and M. S. Plesset, "On the Dynamics of Small Vapor Bubbles in Liquids," J. Math. Phys. 33, No. 4, 308-30 (Jan. 1955), Abst. Sci A-58-5913.

ELECTRICAL EFFECTS AND PROPERTIES

78. T. Alty, "Cataphoresis of Gas Bubbles in Water," Proc. Roy. Soc. (London) 106A, 315-40 (1924), Abst. CA-19-198-6.
79. T. Alty, "Origin of the Electric Charge on Small Particles in Water," Proc. Roy. Soc. (London) A112, 235-51 (1926), Abst. CA-21-2595-3.

80. N. Bakh and A. Gilman, "Electrokinetic Potential at Gas-Liquid Interfaces. I. Cataphoretic Velocity of Gas Bubbles in Solutions of Inorganic Electrolytes," Acta Physicochim. U.R.S.S., 9, 1-26 (1938), Abst. CA-38-8471-1.
81. N. Bakh and A. Gilman, "Electrokinetic Potential at Gas-Liquid Interfaces. II. Cataphoresis of Gas Bubbles in Solutions of Capillary-active Organic Electrolytes," Acta Physicochim. U.R.S.S. 9, 27-38 (1938), Abst. CA-33-8471-3.
82. S. Chapman, "Interpretation of Carrier-Mobility Spectra of Liquids Electrified by Bubbling and Spraying," Phys. Rev. 54, 528-33 (1938), Abst. CA-32-8911-7.
83. B. R. Clanton, "Fundamental Properties of Textile-processing Wastes. VII. Electric Charge on Escaping Bubbles," Textile Research 8, 301-4 (1938), Abst. CA-33-6606-1.
84. A. Coehn, "Effect of the Electrostatic Charge of Gas Bubbles Evolved Electrolytically," Z. Electrochem. 29, 306-8 (1923), Abst. CA-17-3446-6.
85. A. Coehn and H. Newmann, "Electrostatic Phenomena of Electrolytically Generated Gas Bubbles. I. Electrostatic Attraction and Bubble Size. II. Electrostatic Repulsion; The Gas-jet Electrode," Z. Physik. 20, 54-67, 68-81 (1923), Abst. CA-18-1081-9.
86. A. Coehn, "On What Does the Adherence and Size of Electrolytic Gas Bubbles Depend?" Z. Elektrochem. 29, 1-5 (1923), Abst. CA-17-1579-1.
87. B. V. Deryagin, "A Theory of Interaction of Particles in Presence of Electric Double Layers and Stability of Lyophobic Colloids and Disperse Systems," Acta Physicochim. U.R.S.S. 10, 333-46 (1939), Abst. CA-33-6115-5.
88. P. Drossbach, "Anode Effect," Z. Elektrochem. 55, 38-41 (1951), Abst. CA-45-5543g.
89. K. Dyk, "The Cataphoresis of Small Gas Bubbles in Various Organic Liquids," Phys. Rev. 31, 913 (1928), Abst. CA-24-4685-2.
90. O. Flint, "Electrolytic Current Flow By Bubble Migration," AERE-M/R-1470 (1954)
91. H. W. Gilbert and P. E. Shaw, "Electrical Charges Arising at a Liquid-Gas Interface," Proc. Phys. Soc. (London) 37, 195-214 (1925), Abst. CA-19-2772-9.
92. B. Kabanow and A. Frumkin, "The Size of Electrolytically Generated Gas Bubbles," Z. physick. Chem. A 165, 433-52 (1933), Abst. Ca-24-4685-2.

93. B. Kabanow and A. Frumkin, "The Size of Electrolytically Generated Gas Bubbles," Z. physik. Chem. A-66, 316-17 (1933), Abst. CA-28-416-6.
94. A. Klemm, "Cataphoresis of Gas Bubbles," [Trans. from Physik. Zeit. 39, No. 22, 783-93 (1938)] DTMB-T-137.
95. S. Komagata, M. Niskawa, and S. Etizenya, "The Boundary - Surface Potential of Gas Bubbles," J. Electrochem. Assoc. Japan 7, 298-9 (1939), Abst. CA-36-3083-7.
96. K. Krisnamurti, "The Effect of Magnetic Field on Streams of Charged Particles," Current Sci. 2, 387-8 (1934), Abst. CA-28-4657-6.
97. G. Lovera and H. Pochettino, "Electrification by Bubbling," Nuovo cimento 14, 393-410 (1937), Abst. CA-32-2406-8.
98. J. W. McBain and R. C. Williams, "Determination of the Number of Free Electric Charges on Air Bubbles and Oil Droplets Dispersed in Water Containing a Small Amount of Cetylsulfonic Acid," Colloid Symposium Annual 7, 105-14 (1929), Abst. CA-24-3414-2.
99. T. A. McLaughlin, "Cataphoresis of Air Bubbles in Various Liquids," Sci. Proc. Roy. Dublin Soc. 17, 13-17 (1922), Abst. CA-16-4103-1.
100. H. A. MacTaggart, "The Electrification at the Boundary Between a Liquid and Gas," Phil Mag. 44, 386-95 (1922), Abst. CA-16-4102-3.
101. T. Murakawa and S. Nagaura, "Electric Resistance of Gas Bubbles Formed on the Electrodes. I. Effect of Gas Bubbles on Current Distribution," J. Electrochem. Soc. Japan 23, 223-6 (1955), Abst. CA-49-14520i.
102. P. Pannetier, "The Ionization Phenomena that Accompany the Breakage of Liquid Surfaces," Compt. rend. 234, 1881-3 (1952), Abst. CA-46-7842h.
103. R. Piontelli, "Effect of Gas Bubbles on the Electrodeposition of Metals," Rend. ist. lombardo sci. 72, 10-35 (1939), Abst. CA-34-4996-5.
104. W. E. Whybrew, G. D. Kinzer, and R. Gunn, "Electrification of Small Air Bubbles in Water," J. Geophys. Research 57, 459-71 (1952), Abst. CA-47-4168f.

EXPERIMENTAL BUBBLES AND INSTRUMENTATION

105. "The Adaptation of New Research Techniques to Mineral Engineering Problems" (Progress Report), NYO-7173 (1955).

106. R. L. Aspden, "A New High Speed Photographic Technique Applied to the Investigation of Bubbles Bursting at an Air-water Interface," AD-40888 (1954).
107. S. G. Bankoff, "The Entrapment of Gas in the Spreading of a Liquid Drop Over a Rough Surface," American Institute of Chemical Engineers National Meeting, May 6-9, 1956, New Orleans, La.
108. D. C. Blanchard, "A Simple Method for the Production of Homogeneous Water Drops Down to 1 Micron Radius," AD-31990 (1954).
109. W. A. Boothe, "Technical Study of Gas Entrapment in Orifices and in Vertical Passages," KAPL-M-WAB-1 (1953).
110. W. M. Cady and A. M. Zarem, "Brief Pulses Using Kerr Cells," Nature 162, 528 (1948).
111. A. T. Ellis, "Techniques for Pressure Pulse Measurement and High-speed Photography in Ultrasonic Cavitation" AD-75061 (1955).
112. W. Guth, "A Cinematograph Used to Observe the Details of the Condensation of Water Vapor," Akust. Beih. 4, 1, 445-455 (1954), Abst. App Mech Rev-8-828.
113. C. F. Kientzlu et al, "Photographic Investigation of the Projection of Droplets by Bubbles Bursting at a Water Surface," Tellus 6, 1-7 (Feb. 1954), (also AD-20215), Abst. Sci A-57-8954.
114. J. E. Mach, Optical Methods and Instruments. Miscellaneous Physical and Chemical Techniques of the Los Alamos Project, New York, McGraw-Hill (1952).
115. F. R. Marshall and A. M. Zaren, "A Multiple Kerr Cell Camera," Rev. Sci. Instr. 21, 514 (1950).
116. K. R. Tuson, "Single Exposure Photography of a High Speed Event," Brit. J. Appl. Phys. 6, No. 3, 99 (March 1955), Abst. Sci A-58-4277.
117. H. J. White, "The Technique of Kerr Cells," Rev. Sci. Instr. 6, 22 (1935).

EXPLOSIONS

118. A. B. Arons and D. R. Yennie, "Energy Partition in Underwater Explosion Phenomena," Rev. Modern Phys. 20, 519-36 (1948), Abst. CA-45-8247i.
119. B. Friedman, "Theory of Underwater Explosion Bubbles," Commun. Pure Appl. Math. 3 177-99 (1950), Abst. Sci A-53-8569.

120. J. B. Gilstein, "Bubbles Produced by Submerged Exploding Wires," AD-88688 (1955).
121. C. Herring, "Theory of the Pulsations of the Gas Bubble Produced by an Underwater Explosion," NDRC-Div. 6-Report C4-SR20 (1941).
122. J. B. Keller and I. I. Kolodner, "Damping of Underwater Explosion Bubble Oscillations," J. Appl. Phys. 27, 1152-61 (1956).
123. I. I. Kolodner and J. B. Keller, "Underwater Explosion Bubbles II. The Effect of Gravity and the Change of Shape," IMM-NYU-197 (June 1953).

FORMATION

124. R. S. Barnes, "The Formation of Internal Gas Bubbles in Solids," AERE-M/R-1988 (1956).
125. J. B. Bateman and J. Lang, "Formation and Growth of Bubbles in Aqueous Solutions," Can. J. Research 23 E, 22-31 (1945), Abst. CA-39-3477-4.
126. R. J. Benzing and J. E. Myers, "Low Frequency Bubble Formation at Horizontal Circular Orifices," Ind. Eng. Chem. 47, 2087-90 (1955).
127. L. Bernath, "Theory of Bubble Formation in Liquids," Ind. Eng. Chem. 44, 1310-13 (1952), Abst. CA-46-9918i.
128. R. H. Bowers, "Mechanics of Bubble Formation," J. Appl. Chem. 5, 542-8 (1955).
129. R. H. Bowers, "Mechanism of Bubble Formation," Chemistry and Industry, 192 (Feb. 19, 1955).
130. R. L. Datta, "The Design of Gas Lift Pumps. I. The Formation and Characteristics of Gas Bubbles," J. Imp. Coll. Chem. Eng. Soc. 4, 157-69 (1948), Abst. CA-44-4290i.
131. R. L. Datta, D. H. Napier, and D. M. Newitt, "The Properties and Behavior of Gas Bubbles Formed at a circular Orifice," Trans. Inst. Chem. Engrs. (London) Advance Copy 3-16 (Feb. 14, 1950), Abst. CA-44-4748d.
132. L. Davidson and E. H. Arnick, "Formation of Gas Bubbles at Horizontal Orifices," A.I. Ch. E. Journal 2, 337-42 (Sept. 1956), Abst. NSA-10-11788.
133. L. Davidson, "A Study of the Formation of Gas Bubbles from Horizontal Circular Orifices," Univ. Microfilms, Pub. No. 3678. [Dissertation Abstr. 12, 460-1 (1952)], Abst. CA-47-2004f.

134. R. B. Dean, "The Formation of Bubbles," J. App. Phys. 15, 446-451 (1944), Abst. Sci A-47-1981.
135. N. Dombrowski et al, "Liquid Entrainment; Mechanism of Drop Formation from Bubbles," Chem. Age (London) 72, 269-74 (1955).
136. W. G. Eversole and G. H. Wagner, "The Formation of Gas Bubbles in Liquids," Proc. Iowa Acad. Sci. 46, 193-4 (1939), Abst. CA-34-6866-7.
137. W. G. Eversole, G. H. Wagner, and E. Stackhouse, "Rapid Formation of Gas Bubbles in Liquids," Ind. Eng. Chem. 33, 1459-62 (1941), Abst. Sci A-45-394.
138. F. J. Farncomb, "The Initiation of Bubbles in Supersaturated Solutions of Gases," Trans. Roy. Soc. Can. III, (3) 19, 32 (1925), Abst. CA-20-320-1.
139. E. Haidlen, "Sulfur Dioxide Evaporation Ebullition Lag and Bubble Formation," Ice and Cold Storage 41, No. 485, 136 (1938), Abst. CA-33-6091-1.
140. E. N. Harvey, K. W. Cooper, and A. H. Whitely, "Bubble Formation from Contact of Surfaces," J. Am. Chem. Soc. 68, 2119-20 (1946), Abst. Sci A-51-546.
141. E. N. Harvey et al, "Bubble Formation in Animals. I. Physical Factors. II. Gas Nuclei and Their Distribution in Blood Tissues," J. Cellular Comp. Physiol. 24, 1-34 (1944), Abst. CA-39-334-4.
142. E. N. Harvey et al, "The Effect of Mechanical Disturbance on Bubble Formation in Single Cells and Tissues After Saturation with Extra-high Gas Pressure," J. Cellular Comp. Physiol. 28, 325-37 (1946), Abst. CA-41-5-58c.
143. I. Higuchi and T. Takamura, "Limiting Concentration of Bubble Formation in the Liquid Phase," J. Chem. Soc. Japan Pure Chem. Sect. 76, 566-9 (1955), Abst. CA-49-15318d.
144. R. R. Hughes, "Formation of Bubbles at Simple Orifices," Chem. Eng. Progr. 51, 557-63 (1955).
145. R. W. Jackson, "The Formation of Gas Bubbles from Orifices," (a review article) Ind. Chemist 28, 341-51, 391-8 (1952), Abst. CA-47-7829c.
146. A. L. Jacoby and L. C. Bischmann, "Steam Bubble Formation. Effects of Heating Surface and Use of Antifoams," Ind. Eng. Chem. 40, 1360-3 (1948), Abst. CA-42-8038i.

147. H. T. Kennedy and C. R. Olson, "Bubble Formation in Supersaturated Hydrocarbon Mixtures," Trans. Am. Inst. Mining Met. Engrs. 195, Tech. Pub. No. 3441 (In J. Petroleum Tech., No. 1, 4, No. 11, 271-8) (1952), Abst. CA-47-1367g.
148. J. L. King, "The Formation and Subsequent Motion of Water Vapour Cavities in Water," AD-67170 (1950).
149. I. Leibson et al, "Rate of Flow and Mechanics of Bubble Formation from Single Submerged Orifices," A.I. Ch. E. Journal 2, 296-306 (Sept. 1956) (also AD-67792), Abst. NSA-10-11787.
150. W. B. Mann and R. W. B. Stephens, "Bubble Formation in Glass Tubes," Phil. Mag. 15, 143-6 (1933), Abst. NSA-10-11787.
151. Y. Miyake, "The Possibility and the Allowable Limit of Formation of Air Bubbles in the Sea," Papers Meteorol. and Geophys. (Japan) 2, No. 1, 95-101 (1951), Abst. CA-47-11823d.
152. D. M. Newitt, N. Dombrowski, and F. H. Knelman, "Liquid Entrainment. I. Mechanism of Drop Formation from Gas or Vapor Bubbles," Trans. Inst. Chem. Engrs. (London) 32, 244-61 (1954), Abst. CA-49-12047e.
153. D. M. Newitt et al, "Mechanism of Drop Formation from Gas or Vapor Bubbles," Chemistry and Industry, 165-6 (Feb. 12, 1955).
154. Y. Oyama and K. Iwase, "Absorption of Gas in the Form of Bubbles," Sci. Papers Inst. Phys. Chem. Research (Tokyo) 35, 131-57 (1939), Abst. CA-33-3239-7.
155. Y. Oyama and K. Iwase, "Supplement to the Studies on Absorption of Gas in the Form of Bubbles," Sci. Papers Inst. Phys. Chem. Research (Tokyo) 36, 371-4 (1939), Abst. CA-34-1534-3.
156. M. S. Plesset, "Rate of Formation of Vapor in a Uniformly Heated Liquid," NAA-SR-53 (1949).
157. W. Siemes, "Gas Bubbles in Liquids. I. Formation of Gas Bubbles from Vertical Circular Jets," Chem. Ing. Tech. 26, 479-96 (1954), Abst. CA-49-33g.
158. K. Sigwart, "The Pressure at a Bubble Cap Slot Opening at the Start of Bubble Formation," Z. Ver. deut. Ing. Verfahrenstech, No. 4, 116-18 (1943), Abst. CA-44-8705a.
159. E. Silberman and J. A. Ross, "Generation of Air-water Mixtures in Closed Conduits by Aspiration," AD-54982.
160. K. E. Spells, "Bubble Formation by Rapid Air Flow Through Slots Submerged in Water," Trans. Inst. Chem. Engrs. (London) 32, 167-73 (1954), Abst. CA-49-9969b.

161. K. E. Spells and S. Bakowski, "The Formation of Bubbles at Closely Spaced Slots Submerged in Water," Trans. Inst. Chem. Engrs. (London) 30, 189-96 (1952), Abst. CA-47-6713c.
162. K. E. Spells and S. Bakowski, "A Study of Bubble Formation at Single Slots Submerged in Water," Trans. Inst. Chem. Engrs. (London), (Advance Copy) 28-41 (Feb. 14, 1950), Abst. CA-44-4729b.
163. C. R. Stewart et al, "Rose of Bubble Formation in Oil Recovery by Solution Gas Drives in Limestone," Trans. Am. Inst. Mining Met. Engrs. 201, Tech. Pub. 3962 (In J. Petroleum Tech. 6, No. 12, 21-8) (1954), Abst. CA-49-4268h.
164. S. Takagi, "Theory of the Formation of Bubbles," J. Appl. Phys. 24, 1453-62 (1953), Abst. Sci A-57-2364.
165. D. W. Van Krevelen and P. J. Heftijzer, "Gas Bubble Formation Calculation of Interfacial Area in Bubble Contactors," Chem. Eng. Progr. 46, No. 1, 29-35 (1950), Abst. CA-44-3308f.
166. R. H. Wilson, "Literature Survey Re: Bubble Formation," CF-50-4-148 (April 27, 1950).

GENERAL

167. R. Clough, "Homogeneous Aqueous Reactor Experiment Objectives and Requirements," HARD/Pl9 (Jan. 1956).
168. P. Eggleton and W. O. Kermack, "Boiling and Bubbling," Chem. Products 8, 75-80 (1945), Abst. CA-40-2246-4.
169. I. I. Gardescu, "Gas Bubbles Within Capillary Spaces," Oil Gas J. 28, No. 40, 42, 115-6 (1930), Abst. CA-24-4925-9.
170. F. H. Garner and D. Hammerton, "Circulation Inside Gas Bubbles," Chem. Eng. Sci. 3, 1-11 (Feb. 1954), Abst. CA-48-7955g.
171. J. B. Hatcher and B. H. Sage, "Non-equilibrium Behavior in Heterogeneous Hydrocarbon Systems," Ind. Eng. Chem. 33, 443-452 (1941), Abst. Sci A-44-2477.
172. P. N. Haubenreich, "A Power Cycle Study," CF-51-11-28 (1951).
173. T. H. Hazlehurst, "Demonstration of Phenomena at Interfaces-hanging Bubbles and Rolling Drops," J. Chem. Educ. 25, 252-3 (1948), Abst. CA-42-5285a.
174. F. W. Helsby and K. R. Tuson, "Behavior of Air Bubbles in Aqueous Solutions," Research (London) 8, 270-5 (1955), Abst. CA-49-13714c.
175. F. L. Hopwood, "Water Bells," Proc. Phys. Soc., (London) B, 65, 2-5, (Jan. 1952), Abst. Sci A-55-2459.

176. E. H. Kennard, "Radial Motion of Water Surrounding A Sphere of Gas in Relation to Pressure Waves, " DTMB-517 (1943).
177. R. S. J. Manley and S. G. Mason, "Particle Motions in Sheared Suspensions. III. Further Observations of Collisions of Spheres, " Can. J. Chem. 33, 763-73 (1955), Abst. CA-49-15364d.
178. A. R. Mumford, "A Theory of Carryover, " Combustion 18, No. 8, 39-41 (1947), Abst. CA-41-4257e.
179. O. C. Ralston, "The Ferric Sulfate-sulfuric Acid Process, " Bureau of Mines, Bull. No. 260 (1927), Abst. CA-22-845-9.
180. W. E. Rice and S. M. King, "Studies of the Ignition and Burning Rates of Liquid Monopropellants, " AD-83468 (1955).
181. F. C. Roesler, "Comment on 'Gas Bubbles in Solutions', " J. Chem. Phys. 19, 512-3 (1951), Abst. NSA-5-5645.
182. L. I. Schiff, "Air Bubble Breakwater, " AD-80217 (1953).
183. R. S. Scorer et al, "Bubble Theory of Penetrative Connection, " Quart. J. Roy. Meteorol. Soc. 79, 94-103, Jan.; 288-92 April (1953), Abst. Sci A-57-6171.
184. W. D. Scouller and J. Nixon, "Solution of Oxygen from Air Bubbles, " J. Inst. Sewage Purification, 258-75 (1934), Abst. CA-30-3304-5.
185. R. Seeliger, "Gas Bubbles in Liquids, "Naturwissenschaften, (A Review Copy) 36, 187-8 (1949), Abst. CA-44-3759f.
186. W. E. Thompson, "Homogeneous Reactor Project Quarterly Progress Report for Period Ending January 1, 1953, " ORNL-1478 (1953).

GROWTH

187. V. J. Berry, "Effect of a Liquid Phase Velocity on the Growth and Collapse of Gas Bubbles, " J. Chem. Phys. 20, 1045 (June 1952), Abst. Sci A-55-6327.
188. P. Dergarabedian, "Observations on Bubble Growths in Various Superheated Liquids, " AD-91520 (1956).
189. P. Dergarabedian, "The Rate of Growth of Vapor Bubbles in Superheated Water, " J. App. Mech. 20, 537 (1953), Abst. CA-48-1753g.
190. A. J. E. Foreman, "Calculations on the Rate of Swelling of Gas Bubbles (in metals), " AERE-T/M-134 (1956).

191. H. K. Forster and N. Zuber, "Growth of a Vapor Bubble in A Superheated Liquid, " J. App. Phys. 25, 474-8 (1954).
192. H. K. Forster, "On the Conduction of Heat into a Growing Vapor Bubble, " J. App. Phys. 25, 1067-8 (1954).
193. R. Fricke and W. Blencke, "The Growth of Freely Floating Gas Bubbles in Liquids Saturated with the Same Gas, " Z. Physik Chem. 107, 136-9 (1923), Abst. CA-18-924-1.
194. R. Fricke, "Growth of Gas Bubbles Suspended in Liquids which are Supersaturated with the Same Gas, " Z. Physik Chem. 104, 363-402 (1923), Abst. CA-17-2979-7.
195. F. R. Gillmore, "The Growth or Collapse of a Spherical Bubble in a Viscous Compressible Liquid, " California Institute of Technology, Hydrodynamics Lab. Pasadena, Calif., (Report No. 26-4) (April 1, 1952).
196. P. Griffith, "Bubble Growth Rates in Boiling, " NP-6188 (June, 1956).
197. H. Mache, "The Diffusion and Transition of Gases into Liquids. I. Solution and Growth of Air Bubbles in Water, " Sitzber. Akad. Wiss. Wien, Abt. II A, 138, 529-56 (1929), Abst. CA-1555-4.
198. M. S. Plesset and S. A. Zwick, "The Growth of Vapor Bubbles in Superheated Liquids, " J. App. Phys. 25, 493-500 (1954), Abst. CA-48-7372a.
200. J. Saneyoshi and S. Murimura, "Growth and Extinction of Bubbles in Water, " Oyo Butsuri, 12, 384-91 (1943), Abst. CA-41-4993h.
201. N. Zuber, "The Rate of Growth of a Vapor Bubble in a Superheated Liquid, " Thesis-M.S. -UCLA (Los Angeles)(1954).
202. S. A. Zwick, "The Growth and Collapse of Vapor Bubbles, " AD-54059 (1954).

INSTABILITY AND ABSORPTION

203. J. C. Allred, G. H. Blount, and J. H. Miller, "Experimental Studies of Taylor Instability, " LA-1600 (1953).
204. G. Birkhoff, "Note on Taylor Instability, " Quart. Appl. Math. 12, 3, 306-309 (Oct. 1954), Abst. App Mech Rev-8-1409.
205. G. Birkhoff, "Taylor Instability and Laminar Mixing, " LA-1862 (Dec. 1954), Abst. NSA-9-6245.

206. O. S. Bogdanov, B. V. Kizevalter, and S. G. Moslova, "Effect of the Frothing Agent on the Air Content in the Flotation Pulp," Izvest. Akad. Nauk S.S.S.R. Otdel Tekh. Nauk, 412-16 (1950), Abst. CA-45-9431h.
207. V. I. Dal and M. A. Vitkina, "The Mechanism of Absorption During Bubbling," J. Appl. Chem. (U.S.S.R.) 23, 609-13 (1950), Abst. CA-46-10792e.
208. H. Englehard and W. Schillke, "Absorption of Aerosols in Liquids," Kolloid-Z. 86, 213-19 (1939), Abst. CA-33-3654-9.
209. A. Guyer and X. Pfister, "The Absorption of Gas Bubbles," Helv. Chim. Acta. 29, 1173-83 (1946), Abst. CA-40-6922-4.
210. A. Guyer and X. Pfister, "The Absorption of Gas Bubbles II," Helv. Chim. Acta. 29, 1400-12 (1946), Abst. CA-41-4026g.
211. A. Guyer et al, "The Absorption Process for Gas Bubbles," Helv. Chim. Acta 38, 1192-1202 (1955), Abst. CA-49-14390c.
212. E. N. Harvey et al, "Removal of Gas Nuclei from Liquids and Surfaces," J. Am. Chem. Soc. 67, 156-7 (1945), Abst. CA-39-1094-4.
213. S. Kamei et al, "Desorption of Carbon Dioxide by Bubbling and Spraying," Chem. Eng. (Japan) 17, 309-15 (1953), Abst. CA-47-9064h.
214. L. A. Mochalova and M. Kh. Kishinevskii, "Kinetics of Bubble Absorption," J. Appl. Chem. (U.S.S.R.) 28, 25-33 (1955), Abst. CA-49-10024e.
215. F. C. Roesler, "On the Elimination of Gases from Liquids in Laminar Flow," Z. Angew. Phys. 3, No. 10, 376-9 (1951), Abst. App Mech Rev-5-1457.

LIGHT SCATTERING

216. G. E. Davis, "Scattering of Light by an Air Bubble in Water," J. Opt. Soc. Amer. 45, 572-81 (1955).

JETS

217. C. A. Cross and H. Ryder, "The Correlation of Slot-opening with Flow Rate for Air Bubbling into Water," J. Appl. Chem. (London) 2, 51-60 (1952), Abst. CA-46-7375f.
218. C. A. Cross, "Correlation of Slot-opening with Flow Rate for Vapor Bubbling into a Liquid," Chemistry and Industry, 692 (1952), Abst. CA-47-6193i.

219. B. Dunne and B. Cassen, "Some Phenomena Associated with Supersonic Liquid Jets," UCLA-263 (1953).
220. K. E. Spells, "Sensitive Bubble Jets," Proc. Phys. Soc. (London) B, 66, 258-9 (March 1953), Abst. Sci A-56-3908.

MASS TRANSFER

221. T. H. Chilton and A. P. Colburn, "Mass Transfer (absorption) Coefficients," Ind. Eng. Chem. 26, No. 11, 1183-87 (1934).
222. P. D. Coppock and G. T. Meiklejohn, "Behavior of Gas Bubbles in Relation to Mass Transfer," Trans. Inst. Chem. Engrs. (London) 29, 75-86 (1951), Abst. CA-46-7375h.
223. C. L. Gregory, "Mass Transfer Between Forming Drops and a Continuous Liquid Phase," Massachusetts Institute of Technology, Department of Chemical Engineering, (Cambridge, Mass.) no date.
224. U. Grossmann, "Mass and Heat Transfer Between Liquid and Rising Steam Bubbles in Two Phase Mixtures," Chem. Technik 28, 107-112 (1956), Abst. App Mech Rev-9-4084.
225. P. S. Li, "Unsteady-state Mass Transfer from Gas Bubbles: Liquid Phase Resistance," Thesis, U. of Wash., (Seattle,) [Dissertation Abstr. 13, 741-2 (1953)], Abst. CA-48-1077g.
226. R. W. Shrange, A Theoretical Study of Interphase Mass Transfer, Col. Univ. Press, New York (1953), Abst. CA-47-9068a.
227. F. B. West, W. D. Gilbert, and T. Shimizu, "Mechanism of Mass Transfer on Bubble Plates; Plate Efficiencies," Ind. Eng. Chem. 44, 2270-8 (1952).

MEASUREMENT

228. E. A. Budge, "A New Form of Bubble Counter for Measurement of Gas Evolution," J. Am. Chem. Soc. 53, 2451-3 (1931), Abst. CA-25-4446-1.
229. D. A. Glaser et al, "Bubble Counting for the Determination of the Velocities of Charged Particles in Bubble Chambers," Phys. Rev. 102, 1653-8 (1956).
230. A. O. Newman and B. J. Lerner, "Electronic Method for Bubble Frequency Measurement," Anal. Chem. 26, 417-18 (1954), Abst. CA-48-4263i.

231. L. Steber, "How to Meter Accurately When Liquids Contain Bubbles," Chem. Ind. 60, 210 (1953).
232. S. C. Sun and R. C. Troxell, "Quantitative Bubble Pick-up Methods," Mining Eng. 5: Trans. 715 (1953).

MOTION RISE

233. G. Benfratello, "Motion of an Air Bubble Through a Fluid at Rest," Energia elett 30, 2, 80-97 (Feb. 1953), Abst. App Mech Rev-8-1040.
234. R. C. Binder, "Determining Fall or Rise Velocity of Spheres in Fluids," Chem. and Met. Eng. 51, No. 8, 104-5 (1944), Abst. CA-38-5704-7.
235. W. N. Bond, "Bubbles and Drops and Stokes' Law," Phil. Mag. [7] 4, 889-98 (1927), Abst. CA-22-522-5.
236. W. N. Bond and D. A. Newton, "Bubbles, Drops and Stokes' Law," Phil. Mag. [7] 5, 794-800 (1928), Abst. CA-22-2501-7.
237. T. Bryn, "Speed of Rise of Air Bubbles in Liquids," Trans. from Forsch. Gebiete Ingenieurw. A or B, 4, 27-30 (1933). DTMB-TRANS-132.
238. R. M. Davies and G. Taylor, "The Mechanics of Large Bubbles Rising Through Extended Liquids in Tubes," Proc. Roy. Soc. A 200, 375-90 (1950), Abst. Sci A-53-2952.
239. M. S. Donaldson, "Initial Velocity of Bubbles in a Pneumatic Flotation Cell," Mining Sci. Press 120, 940-2 (1920), Abst. CA-14-2458-3.
240. A. Gorodetskaya, "The Rate of Rise of Bubbles in Water and Aqueous Solutions at Great Reynolds Numbers," Zhur. Fiz. Khim. 23, 71-7 (1949), Abst. CA-43-4082b.
241. G. I. Taylor, "The Vertical Motion of a Spherical Bubble and the Pressure Surrounding It," DTMB-510 Gt. Brit. Ministry of Home Security (August 1943), Abst. NSA-10-4691.
242. W. L. Haberman and R. K. Morton, "An Experimental Investigation of the Drag and Shape of Air Bubbles Rising in Various Liquids," DTMB-802 (1953), Abst. NSA-9-6244.
243. W. L. Haberman and R. K. Morton, "An Experimental Study of Bubbles Moving in Liquids," Proc. Am. Soc. Civil Eng. 80, Separ. No. 387 (Jan. 1954).
244. F. Kaissling, "The Velocity of Rising of Bubbles of Vapour in Boiler Tubes," AERE-Lib/TRANS-510 [Trans. From Forsch. Gebiete Ingenieurw. 14B, 30-4 (1934)] Abst. NSA-9-7400.

245. E. H. Kennard, "Radial Motion of Water Surrounding a Sphere of Gas," DTMB-516 (Sept. 1943).
246. V. S. Kocho, "The Nature of the Change of the State of a Gas in Bubbles Rising in a Liquid," Doklady Akad Nauk. S.S.S.R., 66, 605-7 (1949), Abst. CA-43-6480i.
247. R. M. Ladyzhenskii, "Investigation of Use of Air Bubbles in Water at High Reynolds Numbers," J. Appl. Chem. (U.S.S.R.) 27, 17-25 (1954), Abst. CA-49-5924h.
248. W. Luchsinger, "Disperse Gases. III. Size of Bubble and Time of Rising," Kolloid-Z. 81, 180-2 (1937), Abst. CA-32-3229-6.
249. O. Miyagi, "The Motion of an Air Bubble Rising in Water," Phil. Mag. 50, 112-40 (1925), Abst. CA-19-3044-5.
250. M. P. O'Brien and J. E. Gosline, "Velocity of Bubbles in Vertical Tubes," Ind. Eng. Chem. 27, 1436-40 (1935), Abst. CA-30-655-1.
251. T. Pearcey and G. W. Hill, "The Accelerated Motion of Droplets and Bubbles," Austral. J. Phys. 9, No. 1, 19-30 (Mar. 1956), Abst. Sci A-59-6411.
252. F. N. Peebles, "Bubble Velocities," CF-52-4-197, 497-513 (1952).
253. F. N. Peebles and H. J. Garber, "The Motion of Gas Bubbles in Liquids," Chem. Eng. Progr. 49, 88-97 (1953), Abst. CA-47-3623h.
254. H. F. Poppendiek, "Bubble Behavior Within Liquids Flowing in Tubes Containing "U" Bends," CF-52-3-20 (1952).
255. J. V. Robinson, "The Rise of Air Bubbles in Lubricating Oils," J. Phys. & Colloid Chem. 51, 431-7 (1947), Abst. CA-41-3947i.
256. B. Rosenberg, "The Drag and Shape of Air Bubbles Moving in Liquids," U-13936 (1950).
257. W. Siemes, "Gas Bubbles in Liquids. II: The Rise of Bubbles in Liquids," Chem. Ing. Tech. 26, 614-30 (1954).
258. N. I. Smirnov, "Movement of Bodies in a Medium. VII: Velocity of Movement of Drops in a Medium in Laminar Region," J. Appl. Chem. (U.S.S.R.) 25, 1357-61 (1952).
259. N. I. Smirnov and V. L. Ruban, "Movement of Bodies in a Medium. VIII: Droplet Motion in Media," J. Appl. Chem. (U.S.S.R.) 26, 95-8 (1953), Abst. CA-49-7328f.
260. N. I. Smirov and V. L. Ruban, "Relative Velocities of Motion of Drops," Zhur. Priklad. Khim. 22, 1068-77 (1949), Abst. CA-46-4320b.

261. V. N. Stabnikov, "The Motion of a Current of Gas in a Viscous Liquid," Kim. Mashinostroenie 7, No. 1, 6-15 (1938), Abst. CA-34-3967-1.
262. S. Uno and R. C. Kuiter, "Effect of Wall Proximity on The Rate of Rise of Single Air Bubbles in a Quiescent Liquid," A.I. Ch. E. Journal 2, 420-6 (1956).
263. H. Verschoor, "Some Aspects of the Motion of a Swarm of Gas Bubbles Rising Through a Vertical Liquid Column," Trans. Inst. Chem. Engrs. (London), (Advanced Copy) 42-6 (Feb. 14, 1950), Abst. CA-44-4729f.
264. M. A. Vitkina, "Motion of Gas Bubbles in the Bubbling Process," Zhur. Priklad. Khim. 24, 1041-4 (1951), Abst. CA-47-5212e.
265. J. T. Weills, "Steam Bubble Size and Rate of Rise Through Water at its Normal Boiling Point.," CT-910 (1943).
266. E. P. Wigner, "The Rate of Rise of Bubbles," AECD-1983 (1944).

NUCLEATION

267. L. Bertanza and G. Martelli, "Influence of Ions on the Nucleation Processed in Liquids II. Liquids Under Positive Pressure in Metastable Thermodynamic Equilibrium (Overheated Liquids)," Nuovo cimento (10) 1, 324-26 (1955), Abst. NSA-9-2663.
268. L. Farkas, "The Velocity of Nuclear Formation in Supersaturated Vapors," Z. physik. Chem. 125, 236 (1927), Abst. CA-21-1575.
269. F. E. Fox and K. F. Herzfeld, "Gas Bubbles with Organic Skin as Cavitation Nuclei," J. Acoust. Soc. Am. 26, 6, 984-9 (Nov. 1954) Abst. Sci A-58-1577.
270. G. Martelli, "Influence of Ions on the Nucleation Processes in Liquids. I. Liquids In Stable Thermodynamical Equilibrium," Nuovo Cimento 12, 250-9 (Aug. 1954), Abst. Sci A-57-10132.
271. I. N. Stranski and R. Kaishev, "Crystal Growth and Formation of Nuclei," Physik Z. 36, 393-403 (1935), Abst. CA-29-5324-5.

PHYSICAL PROPERTIES

272. A. S. Brown et al, "Critical Micelle Concentrations by a Bubble Pressure Method," J. Phys. Chem. 56, 701-5 (1952).
273. G. F. N. Calderwood and E. W. J. Mardles, "Hydraulic Fluids, etc. The Decrease in Rate of Flow Along Tubes of a Column of Liquid When Broken by Air Gaps," AD-52402 (1954).

274. G. H. Epstein, "Report of Literature Survey on Liquid-gas Entrainment Problems," KAPL-M-GHE-1 (1955), Abst. NSA-10-10817.
275. A. A. Evett, "Pressure Reductions in Water Produced by Bubble Layers," AD-62559 (1954).
276. A. A. Evett, "Pressure Reductions in Water Produced by Bubble Layers," AD-62137, Appendix to AD-62559 (1954).
277. F. E. Fox et al, "Phase Velocity and Absorption Measurements in Water Containing Air Bubbles," J. Acoust. Soc. Am. 27, 534-9 (1955).
278. A. Frumkin, "Phenomena of Wetting and the Adhesion of Bubbles," Acta Physicochim. (U.R.S.S.) 9, 313-27 (1938), Abst. CA-33-7641-9.
279. L. M. Kushner and W. D. Hubbard, "The Determination of Critical Micelle Concentration by a Bubble-pressure Method," J. Phys. Chem. 57, 898-9 (1953), Abst. CA-48-2446d.
280. A. D. K. Laird and D. Chisholm, "Pressure and Forces Along Cylindrical Bubbles in a Vertical Tube," Ind. Eng. Chem. 48, 1361-4 (1956).
281. O. P. Lamb, "Air Entrainment in Flowing Water; A Summary and Bibliography of Literature," U-8634 (1949).
282. E. Lange and K. Nagel, "Graphic Representation of Wetting Angles for the Method of Maximum Bubble Pressure," Kolloid-Z. 73, 268-9 (1935), Abst. CA-30-1631-8.
283. W. M. Lomer, "The Forces Between Floating Bubbles and a Quantitative Study of the Bragg 'Bubble Model' of a Crystal," Proc. Cambridge Phil. Soc. 45, 660-673 (Oct. 1949), Abst. App Mech Rev-4-296.
284. H. A. McTaggart, "A Property of Very Small Bubbles of Gas in Water," Trans. Roy. Soc. Can. 18, III, 129-32 (1924), Abst. CA-19-1215-1.
285. J. Mikumo. "Studies on Soap Solutions. I. Composition of Bubbles of Mixed Soap Solutions," J. Soc. Chem. Ind. Japan 37, Suppl. Binding 591-3 (1934), Abst. CA-29-1274-6.
286. T. M. Morris, "Measurement of Equilibrium Forces Between an Air Bubble and an Attached Solid in Water," Mining Eng. 187, Trans. 91-5, 1154-5 (1950).
287. F. W. Preston and J. C. Turnbull, "Physics of Upward Drilling," Glass Ind. 22, 57-9 and 65 (1941), Abst. CA-35-6752-2.

288. P. F. Whelan, "Effect of pH of Xanthate Solutions on the Contact Angle Between a Bubble of Air and an Iron Disulfide Surface not of Minimum Rugosity," J. Phys. Chem. 58, 375-9 (1954).

RADIATION EFFECTS

289. G. A. Askaryan, "On the Density of Bubbles Along the Track of an Ionizing Particle in an Overheated Liquid," Zhur. Eksp. Teor. Fiz., 103, #3, 610-11 (1956).
290. D. A. Glaser, "Some Effects of Ionizing Radiation on the Formation of Bubbles in Liquids," Phys. Rev. 87, 665 (Aug. 15, 1952), Abst. Sci A-55-8529.

REACTORS, EFFECT OF BUBBLES ON

291. R. E. Aven and P. H. Haubenreich, "Radiolytic Gas Generation Rates in the HRT," CF-55-8-77 (Aug. 1955).
292. W. M. Breazeale, "Further Boiling Experiments in the LITR," AECD-3670.
293. W. M. Breazeale, T. E. Cole, and J. A. Cox, "Preliminary Boiling Experiment in the LITR," TID-5065 (1953).
294. R. Clough, "Density Change and Pressure Drop in Boiling Reactor," BWR-3 (1954).
295. J. A. DeShonge, Jr., "Styrofoam Simulation of Boiling and Temperature Effects in the EBWR Cold Critical Experiment," ANL-5697 (March, 1957).
296. F. P. Durham, "Radiolytic-gas Bubbling Improves Convective Heat Transfer in SUPO," Nucleonics 13, No. 5, 42-6 (May 1955).
297. P. R. Kasten, "Boiling Reactors. Variation of Reactor Stability with Operating Power Level and Average Bubble Size," CF-51-11-130, (Nov. 1951).
298. D. L. Katz, "Nucleation and Rate of Bubble Growth in Homogeneous Reactor Experiment," CF-51-8-266 (1951), Abst. NSA-10-10927.
299. J. A. Lane, "The Bubble Problem in the Homogeneous Reactor," ORNL-728 (1949), Abst. NSA-10-6424.
300. J. R. Dietrick and D. C. Layman, "Transient and Steady-state Characteristics of a Boiling Reactor," ANL-5211 (Feb. 1954).
301. C. F. Leyse, "A Proposal for an In-pile Film Boiling Experiment in the MTR," IDO-16118 (1953).
302. W. M. Lomer, "Effect of Reactor Flux on Boiling Water," AERE-T/M-136 (Apr. 1956), Abst. NSA-10-7621.

303. P. A. Lottes, "Boiling Studies at Argonne Relative to Boiling Reactors, " Proc. Conf. Nuclear Eng. (1955), Abst. CA-49-15515d.
304. R. N. Lyon, "Preliminary Report on the 1953 Los Alamos Boiling Reactor Experiments, " CF-53-11-210 (1953).
305. F. N. Peebles, "The Motion of Gas Bubbles in the HRE Reactor Core, " ORNL-1171 (1952).
306. F. P. Pike, "Gas Evolution in a Homogeneous Pile, " CF-50-6-162 (June, 1950).
307. R. F. Recht, "Pile Coolant Boiling--Causes and Effects. Tolerable Flow Reductions, Power Excursions Before Unstable Flow due to Boiling, " HW-31649 (1954).
308. J. P. Sanders, "Gas Production in the ISHR, " CF-53-1-110 (1953).
309. D. G. Thomas, "Preliminary Boiling Experiments in the SUPO Model of the Water Boiler, " CF-53-7-221 (July 1953).
310. S. A. Untermeyer, "Dual Cycle Improves Boiling-Water Reactors, " Nucleonics 13, No. 7, 34-5 (1955), Abst. NSA-9-7532.
311. H. C. Urey, "Boiling Water Experiments Relative to Boiling Reactors, " CF-51-8-45 (1951).
312. J. E. Wilkens, Jr., "The Effect of Bubbling on the Multiplication Constant, " CP-2709 (Feb. 1945).
313. J. E. Wilkens, Jr., "The Effect of Bubbling on the Multiplication Constant II, " CP-3067 (June 1945).
314. W. K. Woods and H. Worthington, "Boiling In a Pile, " DUH-10169 (1943).
315. W. K. Woods, "Qualitative Analysis of Pressure Drop During In-Pile Boiling, " HW-31157 (1954).

SIZE

316. P. Bohrisch, "Estimation of Bubble Size in Oxygen Baths Containing Sodium Perborate (Menzel's Method), " Berlin u. Munch. tierarztl. Wochschr. 12, 179-80 (1942), Abst. CA-37-4531-4.
317. A. Guyer and E. Peterhaus, "The Size of Gas Bubbles I. Formation by Single Capillaries. II. Formation by Filter Plates, " Helv. Chim. Acta 26, 1099-1107 (1943), Abst. CA-38-2253-7.
318. S. Halberstadt and P. H. Prausnitz, "On the Size of Gas Bubbles and Droplets in Liquids, " [Trans. from Z. angew. Chem. 43, 970-7 (1930)] DTMB-TRANS-108.

319. E. Jenckel and H. Hammes, "The Size of Hydrogen Bubbles from Aluminum in Hydrochloric Acid," Z. anorg. allgem. Chem. 233, 415-23 (1937), Abst. CA-31-8334-7.
320. P. C. Newman and P. F. Whelan, "Relation of Volume of Bubble to Diameter of Orifice at Which it is Formed," Nature 169, 326-7 (Feb. 1952).
321. C. J. Quigley et al, "Size and Mass Transfer Studies of Gas Bubbles," Chem. Eng. Prog 51, 422 (1955).
322. H. Remy and W. Seemann, "Dependence of Absorption of Mists by Liquids on the Bubble Size. II," Kolloid-Z 72, 279-91 (1935), Abst. CA-29-7742-4.
323. H. Remy and W. Seemann, "The Effect of Bubble Size on the Absorption of Fogs by Liquids," Kolloid-Z 72, 3-12 (1935), Abst. CA-29-7742-2.
324. R. Schnurmann, "On the Size of Gas Bubbles in Liquids," [Trans. from Kolloid-Z. 80, 148-51 (Aug. 1937).] DTMB-TRANS-111.
325. R. Schnurmann, "The Size of Gas Bubbles in Liquids," [Trans. from Z. physik. Chem. 143, No. 5 & 6, 456-74 (Sept. 1929)] DTMB-TRANS-110, Abst. NSA-10-11786.
326. R. Schnurmann, "The Size of Gas Bubbles in Liquids and its Effects on the Rate of Solution of Metals in Liquids with Hydrogen Evolution and on Priming of Boiler Feed Water," J. Soc. Chem. Ind. 58, No. 5, 172-8 (1939), Abst. CA-33-6679-8.

SOLUBILITY: GAS FRACTURE DATA: DIFFUSION:
DISSOLVED GAS EFFECT

327. A. G. Anderson, "The Distribution of Air in Self-Aerated Flow in a Smooth Open Channel," AD-73408 (1955).
328. A. J. Beck, "Diffuser Plate Studies," Sewage Works J. 8, 22-37 (1936), Abst. CA-30-3917-9.
329. F. G. Blake, "The Tensile Strength of Liquids: A Review of the Literature," NP-3800 (1949).
330. F. Brandstaetter, "Remarks on H. Mache's Method for the Determination of the Diffusion Coefficient of Air in Water," S. B. Osterr. Akad. Wiss. IIA, 161, No. 4-6, 107-30 (1952), Abst. Sci A-56-4649.
331. L. J. Briggs, "Limiting Negative Pressure of Water," J. Appl. Phys. 21, 721-722 (1950).

332. L. J. Briggs, "Maximum Superheating of Water as a Measure of Negative Pressure," J. Appl. Phys. 26, No. 8, 1001-4 (Aug. 1955), Abst. Sci A-58-8693.
333. P. Cohen and K. Vogen, "The Effect of Dissolved Gases on the Bubble Point of Water," WAPD-RM-7 (Feb. 1950).
334. B. Derouet, "Study of the Degassing of Liquids under the Action of Ultrasonic Vibrations of 80 and 17.7 kc/s," Compt. Rend. 234, 71-3, (Jan. 1952), Abst. Sci A-55-34-2.
335. H. H. Dixon, "On the Tensile Strength of Soys," Proc. Roy. Soc. (Dublin) 14, 229 (1914).
336. J. C. Fisher, "The Fracture of Liquids," J. Appl. Phys. 19, 1062-67 (1948).
337. F. H. Garner, "Mechanics of Drops and Bubbles in Diffusion Processes," Chemistry and Industry 141-5 (Feb. 1956).
338. V. I. Patieff and V. P. Teodoravich, "On the Solubility of Hydrogen in Water," J. Gen. Chem. (U.S.S.R.) 4, 395-9 (1934).
339. L. Pode, "The Diffusion of Air into a Pulsating Cavitation Bubble," DTMB-804 (1955), Abst. App Mech Rev-9-2959.
340. A. A. Ravdel, "The Problem of Gas Bubbles in Liquid," J. Appl. Chem. (U.S.S.R.) 26, 703-7 (1953), Abst. CA-49-5078d.
341. R. Schlegel, "Solubility and Diffusion Constants for Gases," CP-2883 (April 1945).
342. H. N. V. Temperly, "The Behavior of Water Under Hydrostatic Tension, I, II, III.," Proc. Phys. Soc. 59 (Pt.2) (332), 199-208 (1947).

SOUND EFFECT

343. L. Bauer and M. Strasberg, "The Sound of Air Bubbles Released from Nozzles," AD-17861 (1953).
344. Ya. Frenkel, "Electrical Phenomena Associated with Cavitation Due to Ultrasonic Vibrations in Liquids," Acta Physicochim. (U.S.S.R.) 12, 317-22 (1940), Abst. CA-34-7682-6.
345. W. J. Galloway, "An Experimental Study of Acoustically Induced Cavitation," AD-24646 (1953).
346. M. Harrison, "An Experimental Study of Single Bubble Cavitation Noise," J. Acoust. Soc. Am. 24, 776-82 (Nov. 1952), Abst. Sci A-56-715.

347. A. P. Kapustin, "The Degassing of Liquids in an Ultrasonic Field," Zh. Tekli. Fiz. 24, No. 6, 1008-11 (1954), Abst. Sci A-58-3520.
348. F. C. Karal, "A Study of the Scattering of Sound Waves in Fluids. Part I: Scattering of a Plane Wave by a Spherical Bubble," AD-14874 (1953).
349. D. T. Laird and P. M. Kendig, "Attenuation of Sound in Water Containing Air Bubbles," J. Acoust. Soc. Am. 24, 29-32 (1952).
350. E. Meyer and E. Skudrażyk, "About the Acoustic Properties of Gas Bubble Clouds in Water," Akust. Beih. 3, 434 (1953).
351. E. A. Neppiras and B. E. Noltingk, "Cavitation Produced by Ultrasonics; Theoretical Conditions for the Onset of Cavitation," Proc. Phys. Soc. (London) 64B, Part 12, 384B, 1032-38 (1951), Abst. App Mech Rev-5-1761.
352. H. Nodtvedt, "The Effect of Sound Waves on The Ascending Velocity of Air Bubbles in Viscous Liquids," Beretn. Michelsens Inst. Vidensk. 12, No. 5, 13 (1948), Abst. Sci A-55-91.
353. B. E. Noltingk and E. A. Neppiras, "Cavitation Produced by Ultrasonics," Proc. Phys. Soc. (London) 63B, Pt. 9, 369B, 674-685 (1950), Abst. App Mech Rev-5-1760.
354. L. Pode, "The Deaeration of Water by a Sound Beam," DTMB-854 (1953), Abst. App Mech Rev-7-3613.
355. A. Roll, "Influence of Ultrasonics on Electrolytic Processes. II, Agitation Provided by Ultrasonics," Z. Metallkunde 41, 339-43 (1950), Abst. CA-45-4581c.
356. M. D. Rosenberg, "Pulsations and Growth of Gas-Filled Bubbles in Sound Fields," AD-4142 (1952).
357. H. H. Rust, "Chemical Effects of Supersonics," Angew. Chem. 65, 249-52 (1953), Abst. CA-47-7276i.
358. L. Spitzer, "Acoustical Properties of Gas Bubbles in a Liquid," OSRD-1705 (July 1943).
359. M. Strasberg, "Gas Bubbles as Sources of Sound in Liquids," J. Acoust. Soc. Am. 28, 1, 20-26 (Jan. 1956), Abst. App Mech Rev-9-3111.
360. P. J. Westervelt, "Adsorption of Sound by Gas Bubbles at a Water-Metal Interface," J. Acoust. Soc. Am. 23, 369 (1951).
361. K. Yosioka and Y. Kawasima, "Acoustic Radiation Pressure on a Compressible Sphere," Acustica 5, No. 3, 167-73 (1955), Abst. Sci A-58-9509.

362. K. Yosioka et al, "Acoustic Radiation Pressure on Bubbles and Their Logarithmic Decrement, " Acustica 5, No. 3, 173-8 (1955), Abst. Sci A-58-9510.

STABILITY

363. C. Barus, "Glue Bubbles, " Science 57, 151-3 (1923), Abst. CA-17-1569-2.
364. A. M. Binnie, "The Stability of the Surface of a Cavitation Bubble, " Proc. Cambridge Phil. Soc. 49, Pt. 1, 151-5 (1953), Abst. Sci A-56-3909.
365. G. Birkhoff, "Stability of Spherical Bubbles, " Quart. Appl. Math. 13, 4, 451-453 (Jan. 1956), Abst. App Mech Rev-9-1853.
366. F. H. Constable and S. Reizi, "Maximum Life of Bubbles in Oil, " Rev. fac. Sci. Univ. Istanbul 10A, No. 114, 43-53 (1946), Abst. CA-40-4933-2.
367. P. S. Epstein and M. S. Plesset, "The Stability of Gas Bubbles in Liquid-Gas Solutions, " J. Chem. Phys. 18, 1505-9 (1950), Abst. Sci A-54-2428.
368. P. S. Epstein and M. S. Plesset, "Erratum: The Stability of Gas Bubbles in Liquid-Gas Solutions, " J. Chem. Phys. 19, 256 (1951), Abst. CA-45-3689e.
369. E. Gerjuay, "The Stability of Gas Bubbles in Water, " Phys. Rev. 73, 538 (1948), Abst. CA-43-4066e.
370. B. Krause, "The Stability of Supersaturated Carbonic Acid Solutions, Especially that of Beer, " Svenska Bryggareforen Manadsbl. 51, 221-36 (1936), Abst. CA-32-4272-8.
371. R. F. Larson, "Occurrence of Metastable States of Liquid and Vapor, " Ind. Eng. Chem. 37, 1010-16 (Oct. 1945), Abst. Sci A-49-1067.
372. T. Nakagawa and J. Sameshima, "Stability of Liquid Films. II. Experiments on the Life of Single Bubbles, " J. Chem. Soc. (Japan) 64, 360-4 (1943), Abst. CA-41-3343c.
373. M. S. Plesset and T. P. Mitchell, "On the Stability of the Spherical Shape of a Vapor Cavity in a Liquid, " Quart. Appl. Math. 13, 4, 419-430 (Jan. 1956), Abst. App Mech Rev-9-1852.
374. M. S. Plesset, "The Stability of Fluid Flows with Spherical Symmetry, " J. Appl. Phys. 25, 96-8 (1954), Abst. CA-48-5585g.

375. P. Reh binder and E. Wenstrom, "The Stabilizing Action of Adsorption Layers of Surface-Active Substances on Disperse Systems II. The Stability of Bubbles and Drops at Interfaces," Kolloid-Z. 53, 145-58 (1930), Abst. CA-25-630-2.
376. N. I. Smirnov et al, "A Suspended Layer of Particles of Different Shapes," J. Appl. Chem. (U.S.S.R.) 24, 479-87 (1951).

SURFACE TENSION

377. L. F. Evans, "Interaction Between Surfaces in Close Proximity," Nature 172, 776-7 (Oct. 1953), Abst. Sci A-57-1099.
378. F. H. Jarner and P. E. Sawyer, "Surface-active Effects Within Bubbles," Chemistry and Industry, 192-4 (Feb. 19, 1955).
379. W. M. Grosvenor, "A Surface-tension Effect," Science 72, 244-5 (1930), Abst. CA-24-5590-6.
380. T. L. Hill, "Concerning the Dependence of the Surface Energy and Surface Tension of Spherical Drops and Bubbles on Radius," U-16990 (1951).
381. E. B. McLeod, "The Explicit Solution of a Free Boundary Problem Involving Surface Tension," J. Rational Mech. Analysis 4, 4, 557-567 (July 1955), Abst. App Mech Rev-9-1137.
382. H. A. McTaggart, "Study of Films of Oil Inside a Small Bubble of Gas in Water," Trans. Roy. Soc. Can. (3) 21, Sect. 3, 249-54 (1927), Abst. CA-22-1072.
383. F. Michaud, "Theory of Liquid Films," J. chim. phys. 41, 147-59 (1944), Abst. CA-40-263-3.
384. T. Omae and J. Furukawa, "Surface Tension of Fluidized Particles," J. Chem. Soc. Japan. Ind. Chem. Sec. 57, 785-7 (1954), Abst. CA-49-10673b.
385. J. C. Slonczewski and R. Heller, "Determination of the Coefficient of Surface Tension by the Bubble Length Method," Am. J. Phys. 21, 313-14 (Apr. 1953), Abst. Sci A-56-3915.
386. B. Stuke, "The Behavior of the Surface of Gas Bubbles Moving in Liquids," Naturwissenschaften 39, 325-6 (1952), Abst. Sci A-55-7992.
387. S. Sugden, "The Determination of Surface Tension from the Maximum Pressure in Bubbles," J. Chem. Soc. 121, 858-66 (1922), Abst. CA-1627-8.

VAPORIZATION

- 388. K. Bennewitz, "The Process of Vaporization," Ann. Physik. 59, 193-224 (1919), Abst. CA-14-878.
- 389. W. Fritz and W. Ende, "The Vaporization Process According to Cinematographic Pictures of Vapor Bubbles," Physik Z. 37, 391-401 (1936), Abst. CA-30-5849-8.
- 390. E. L. Piret and H. S. Ishin, "Natural-Circulation Evaporation," Chem. Eng. Progr. 50, (6), 305-311 (1954).
- 391. S. I. Sklyarenko and M. K. Baranaev, "The Relation of the Vaporization Velocity to the Nature of the Interface Between Boiling Liquid and Flowing Gas," Z. Physik. Chem. A175, 214-18 (1935), Abst. CA-30-2441-8.
- 392. K. Tschudin, "Rate of Evaporation of Ice," Helv. Phys. Acta 19, 91-102 (1946), Abst. CA-40-3671-7.
- 393. M. Volmer and I. Estermann, "About the Coefficient of Vaporization of Solid and Liquid Mercury," Physik. Z. 7, 1-12 (1921).
- 394. G. Wyllie, "Evaporation and Surface Structure of Liquids," Proc. Roy. Soc. (London) A197, 383 (1949).

VISCOSITY

- 395. R. O. Davies, "The Two Coefficients of Viscosity for an Incompressible Fluid Containing Air Bubbles," Proc. Roy. Soc. (London) A226, 39 (1954), Abst. CA-49-1394f.
- 396. G. Taylor, "Note on the Volume Viscosity of Water Containing Bubbles," Proc. Roy. Soc. (London) A226, 38-9 (1954), Abst. CA-49-1394e.
- 397. G. Taylor, "The Two Coefficients of Viscosity for an Incompressible Fluid Containing Air Bubbles," Proc. Roy. Soc. (London) A226, 34-7 (1954), Abst. CA-49-1394d.
- 398. E. C. Westerfield, "Viscosity in an Expanding Bubble," Phys. Rev. 55, 306-7 (1939), Abst. CA-33-6672-5.

II. BOILING

BURNOUT

- 399. W. H. Jens and P. A. Lottes, "Analysis of Heat Transfer, Burnout, Pressure Drop and Density Data for High-Pressure Water," ANL-4627 (1951).

400. W. H. Jens and P. A. Lottes, "Two-Phase Pressure Drop and Burnout Using Water Flowing in Round and Rectangular Channels," ANL-4915 (1952).
401. L. H. McEwen, "Technical Note on Protection Against Boiling Damage," HW-28563 (1953).
402. C. A. Pursel, "Tube Burn-Out as a Limit to In-Pile Boiling," HW-32820 (1954).
403. W. M. Rohsenow, and P. Griffith, "Correlation of Maximum Heat Flux Data for Boiling of Saturated Liquids," NP-5738 (1955), Abst. NSA-9-7024.
404. J. E. Viscardi, "Boiling Burnout Newsletter No. 4," NDA-6 (1955).
405. J. E. Viscardi, "Boiling Burnout Issue No. 5," NDA-8 (1955).
406. J. E. Viscardi, "Boiling Burnout Progress No. 5," NDA-9 (1955).
407. J. E. Viscardi, "Boiling Burnout Progress No. 8," NDA-24 (1956).

CONVECTION EFFECTS

408. V. V. Bagdanov, "Investigation of the Effect of the Rate of Motion of the Water Current on the Heat Exchange Coefficient on Boiling in an Inclined Tube," [Trans. from Izvest. Akad. Nauk. S.S.S.R. Otdel. Tekh. Nauk., 136-40 (1955)] AERE-LIB/TRANS-596, Abst. NSA-10-4601.
409. F. C. Gunther, "Photographic Study of Surface-Boiling Heat Transfer to Water with Forced Convection," Trans. Am. Soc. Mech. Engr. 73, 2, 115-123 (Feb. 1951), Abst. App Mech Rev-5-242.
410. G. N. Kruzhilin, "Generalization of the Experimental Data on the Heat Transmission at the Boiling of Liquids Under the Conditions of Free Convection," [Trans. from Izvest. Akad. Nauk. Otdel. Tech. Nauk., 701-12 (1949)] AEC-TR-2000, Abst. NSA-9-1809.
411. K. Nakagawa, T. Yoshida, and K. Kamitani, "Quenching Phenomena in Bubble-state Boiling and Natural Convection," Chem. Eng. (Japan) 16, 405-18 (1952), Abst. CA-47-925f.

EFFECT-BOILING PRESSURE DROP

412. H. S. Jacket, J. R. Roarty and N. C. Sher, "Boiling Pressure Drop in Rectangular Channels," WAPD-TH-204 (1956).
413. C. R. McNutt, "Pressure Drop in Two-Phase Annular Flow," HW-35065TH (1955).

414. J. B. Reynolds, "Local Boiling Pressure Drop, " ANL-5178 (1954).
415. J. L. Schweppe and A. S. Foust, "Effect of Forced Circulation Rate on Boiling-Heat Transfer and Pressure Drop in a Short Vertical Tube, " Chem. Eng. Progr. Symposium, Ser. 49 No. 5, Heat-Transfer (Atlantic City), 77-89 (1953), Abst. CA-47-7837d.
416. L. A. Smith and P. C. Ostesgaard, "Boiling Studies Using Special Subassemblies; Low Pressure Loss of Flow, " NRTF-ER-40 (1955).

EVAPORATION AND CONDENSATION

417. F. Bosnjakovic, "Verdampfung and Flussigkeitsuberhitzung, " Tech. Mech. u. Thermodynam. 1, 358 (1930).
418. W. G. Duffield, "The Reaction Consequent Upon the Evaporation of a Liquid and Upon the Emission of Vapors from Small Orifices, " Phil. Mag. 45, 641-88 (1923), Abst. CA-17-2070-7.
419. K. C. D. Hickman and D. J. Trevoy, "High Vacuum Evaporation. The Falling-Stream Tensimeter, " Ind. Eng. Chem. 44, 1882-8 (1952), Abst. CA-47-6707a.
420. M. Jakob, "Condensation and Evaporation; New Conceptions and Experiments, " Z. Ver. Dent. Ing. 76, 1161-70 (1932), Abst. CA-27-789.
421. M. Jakob, "Heat Transfer in Evaporation and Condensation. I., " Mech. Eng. 58, 643 (1936).
422. M. Knudsen, "Die Maximale Verdampfungs--Geschwindigkeit des Quescksilbers, " Ann. Physik. 47, 697-708 (1915).
423. S. S. Penner, "Kinetics of Evaporation, " J. Phys. Chem. 56, 475-479 (1952), Abst. CA-46-8479a.
424. W. H. Rodebush, "Nuclei in Evaporation and Condensation, " Chem. Revs. 44, 269-76 (1949), Abst. CA-43-6047i.

EXPERIMENTAL APPARATUS

425. J. M. Hogan and R. L. Boyd, "Joint Bettis-KAPL Nucleate Boiling Detection Experiment, " WAPD-168 (Feb. 1957).

FILM BOILING

426. R. C. L. Bosworth, "Demonstration of Film and Nuclear Boiling, " J. Proc. Roy. Soc. N. S. Wales, 80, 20-1 (1946), Abst. CA-42-10i.

- 427. J. C. Carter, "The Effect of Film Boiling, " ANL-4766 (1952).
- 428. C. F. Leyse, "Permissible MTR Power Levels with and without Film Boiling, " IDO-16064 (1953).
- 429. E. A. McLean, V. E. Scherrer, and C. E. Faneuff, "Film Boiling of Water by Pulse-Heating Small Wires," J. Appl. Phys. 27, 193-4 (1956).
- 430. J. W. Marx and B. I. Davis, "Film Boiling Termination Mechanism, " J. Appl. Phys. 23, 1354-7 (Dec. 1952), Abst. Sci A-56-793.
- 431. E. I. Motte, "Film Boiling of Flowing Subcooled Liquids, " UCRL-2511 (1954).
- 432. Y. Nakagawa and T. Yoshida, "Film State Boiling at Rapid Cooling: I. Effects due to Conditions of Coolants, " Chem. Eng. (Japan) 16, 74-82 (1952), Abst. CA-46-3808f.
- 433. Y. Nakagawa and T. Yoshida, "Film-State Boiling on Rapid Cooling: II. Effects due to Conditions of Heat-Transfer Surfaces, " Chem. Eng. (Japan) 16, 104-10 (1952), Abst. CA-46-5900a.

GENERAL

- 434. J. M. Batch and K. G. Toyoda, "Experimentally Determined Boiling Curves, " HW-42469 B (1956).
- 435. C. F. Bonilla, "Boiling and Condensing of Liquid Metals, " NYO-3150 (1952), Abst. NSA-7-808.
- 436. R. Bromberg and W. L. Martin, "Density Transients in Boiling Liquid System, " AECU-2169 (1952).
- 437. J. T. Carleton, "Small Diameter Mock-Up Tests of Boiling in Process Tubes, " HW-17563 (1950).
- 438. A. P. Colburn et al, "Effect of Local Boiling and Air Entrainment on Temperature of Liquid-Cooled Cylinders, " NACA-TN-1498 (1948), Abst. CA-42-4403g.
- 439. G. E. Collard and P. C. Ostergaard, "Boiling Studies Using Special Subassemblies; Loss of Flow . . . , " W-STR-ER-38 (1955).
- 440. P. F. Constantine, "The Limiting Over-loads for a Modified Near Boiling LEO-Type System, " LEO/A-40 (1955).
- 441. N. E. Dorsey, "Quiet Boiling, " Phys. Rev. 55, 594 (1939), Abst. CA-34-4943-6.

442. T. B. Drew and A. C. Mueller, "Boiling," Trans. Am. Inst. Chem. Engrs. 33, (a review) 449-71 (1937), Abst. CA-31-8259-8.
443. G. Duch, "Contribution to the Study of the Phenomenon of Boiling Under Constant Pressure," J. Chim. Phys. 33, 414-26 (1936), Abst. CA-30-5850-5.
444. R. M. Fryar, "A Preliminary Analysis of the Problems of In-Pile Boiling," HW-30058 (1953).
445. V. G. Gleim, "The General Theory of Moisture Carry-Over From Boiling Solutions," J. Appl. Chem. (U.S.S.R.) 28, 9-15 (1955), Abst. CA-49-10014d.
446. V. G. Gleim, "Rational Process of Boiling of Solutions and Factors in its Determination," J. Appl. Chem. (U.S.S.R.) 26, 1099-1106 (1953), Abst. CA-49-5079d.
447. K. Goldmann, "Boiling Songs," NDA-10-68 (1953).
448. W. H. Jens and G. Leppert, "Recent Developments in Boiling Research," J. Am. Soc. Naval Engrs. 67, 137-55, 437-56 (1955), Abst. CA-49-12887i.
449. W. Jost, "Boiling Behavior of Multicomponent Systems," Z. Naturforsch. 1, 576-80 (1946), Abst. CA-41-5353e.
450. D. L. Katz et al, "Boiling, Outside Finned Tubes," Petroleum Refiner 34, 113-6 (1955).
451. A. R. Kaufman and R. Schuhmann, "Reactor Cooled by Boiling Metal," TID-2010, 75-6 (1953).
452. S. S. Kutateladze, "A Hydrodynamic Theory of Changes in the Boiling Process Under Free Convection Conditions," [Trans. from Izvest. Akad. Nauk. S.S.S.R. Otdel. Takh. Nauk. AEC-TR-1441, No. 4, 529-36 (1951)] W.O. 27630, Abst. NSA-8-2167.
453. R. F. Larson, "Factors Affecting Boiling in a Liquid," Ind. Eng. Chem. 37, 1004-9 (1945), Abst. CA-40-1074-6.
454. "Light-Water Boiling in Natural-Uranium Reactors," TID-2012, 201-2 (1954).
455. G. Lovera and A. Pochettino, "Electrification by Boiling," Nuovo cimento 17, 161-7 (1940); 18, 269-79 (1941), Abst. CA-36-5069-7.
456. G. L. Lovera and A. Pochettino, "Electrification by Boiling and Dipole Moments," Nuovo Cimento 16, 337-47 (1939), Abst. CA-34-2662-5.

457. S. M. Lukomskii, "An Investigation of the Maximum Heat Flux During the Boiling of Water in Vertical Tubes," [Trans. from Doklady Akad. Nauk. S.S.S.R. 80, 53-6 (1951)] IG-TRANS-(R)-3, Abst. NSA-9-4434.
458. L. H. McEwen, J. M. Batch, and K. G. Toyoda, "Technical Note on Generalization of Boiling Curves," HW-42469C (1956).
459. C. R. McNutt, "Data on Boiling Flow in a 'C' Annulus with Uniform Tube Power. . .," HW-32009 (1954).
460. L. Meyer, "A Thermal Analytical Study of the Equilibrium Between a Boiling Liquid and its Vapor." Z. Physik. Chem. A175, 275-83 (1936), Abst. CA-30-2441-5.
461. J. E. Myers and D. L. Katz, "Boiling Coefficients Outside Horizontal Tubes," Chem. Eng. Progress Symposium, Ser. 49, No. 5, Heat-Transfer (Atlantic City), 107-14 (1953), Abst. CA-47-5733g.
462. J. E. Myers, "The Effects of Fluid Properties on Boiling Coefficients," Univ. Microfilms. Pub. No. 3538, [Dissertation Abstr. 12, 168-9 (1952)], Abst. CA-46-7386e.
463. M. E. Nathan, "Summary of AI Ch. E. Meeting Held in New Orleans, La., May 7-9," NAA-SR-MEMO-1652 (1956).
464. E. I. Nesis and Y. I. Frenkel, "Boiling of a Gas-Filled Liquid," Thur. Tekh. Fiz. 22, 1500-5 (1952), (In Russian), Abst. NSA-7-3071.
465. E. I. Nesis, "Boiling Under Actual Conditions," Zhur. Tekh. Fiz. 22, 1506-12 (1952), (In Russian), Abst. NSA-7-3072.
466. W. Ostwald, "The Question of the Nature of the Critical States in the Transition Liquid-Gas," Kolloid-Z. 64, 50-62 (1933), Abst. CA-27-4454-9.
467. N. A. Petrick, "Mark I Boiling Tests with Special Subassemblies," WAPD-STR (R)-160 (1955).
468. L. A. Philipp and B. E. Tiffany, "Ebullition of Refrigerants," Refrig. Eng. 25, 140-6 (1933), Abst. CA-27-1961-5.
469. F. P. Pike, P. D. Miller, and K. O. Beatty, "Effect of Gas Evolution on Surface Boiling at Wire Coils," Chem. Eng. Progr. Symposium Ser. 51, No. 17, 13-19 (1955), Abst. CA-50-623g.
470. R. H. Purcell, "In-Pile Boiling Capabilities-1706-KER Facility," HW-36136 (1955).
471. D. B. Robinson and D. L. Katz, "Effect of Vapor Agitation on Boiling Coefficients," Chem. Eng. Progr. 47, 317-24 (1951), Abst. CA-45-6436h.

472. A. Rose and W. W. Sanders, "Vertical Umbrella-Type Agitator to Promote Smooth Boiling in Vacuum Distillation," Anal. Chem. 27, 331-2 (1955), Abst. CA-49-7895e.
473. F. Smetona, "Characteristics of Boiling Solutions," CE-3510 (March 1945).
474. M. A. Styrikovich and G. M. Polyakov, "The Critical Thermal Load in the Boiling of a Large Volume of Liquids," Izvest. Akad. Nauk. S.S.S.R. Otdel. Tekh. Nauk. 652-6 (1951), Abst. CA-46-2866b.
475. F. E. Tippets, "Modification of a 1706-KER Loop for Boiling," HW-41174 (1956), Abst. NSA-10-11164.
476. L. A. Tobe, "1706-KER Boiling Investigation," HW-40104 (1955).
477. R. G. Vanderwater and K. G. Toyoda, "Boiling Consideration and Instrumentation Study," HW-26549 (1952).
478. R. G. Vanderwater, "Boiling Limits," HW-23251 (1952).
479. R. G. Vanderwater, "Methods to Alleviate Boiling Limits," HW-24957 (1952).
480. R. G. Vanderwater, "Tube Temperature Rise Limits--Boiling Considerations," HW-23861 (195).
481. L. Weill, "Rapid Determination of the Coefficients of Exchange in Boiling Liquids," J. Phys. radium 12, 824-5 (Oct. 1951), Abst. Sci A-55-1711.
482. P. Werner, "Quantitative Experiments on Boiling Under Reduced and Increased Pressures," Z. Physik. Chem. Unterricht 34, 161-4 (1921), Abst. CA-15-3785-7.
483. J. W. Westwater, "The Boiling of Liquids," Sci. American 190, No. 6, 64-8 (1954), Abst. CA-49-675h.
484. J. W. Westwater, "Photographic Study of Boiling," Ind. Eng. Chem. 47, 1605-10 (1955), Abst. NSA-9-6253.
485. J. W. Westwater, A. J. Lowery, and F. S. Pramuk, "Sound of Boiling," Science 122, 332-3 (1955), Abst. CA-49-15324a.
486. W. K. Woods, "Allowable Temperature Rise in Tubes of the Piles: Precautions Against Boiling," HW-7-2562 (1945).
487. W. E. Zieman and D. L. Katz, "Boiling Coefficients for Finned Tubes," Petroleum Refiner 26, No. 8, 78-82 (1947), Abst. CA-44-4729i.
488. P. C. Zmola and R. V. Bailey, "Power Removal from Boiling Nuclear Reactors," Trans. Am. Soc. Mech. Engr. 78, 881-92 (1956), Abst. NSA-10-8673.

489. L. M. Zysina-Molozhen, and S. S. Kutateladze, "The Effect of Pressure on the Mechanism of Steam Formation in a Boiling Liquid," Zhur. Tekh. Fiz. 20, 110-16 (1950), Abst. NSA-5-5443.

NUCLEATE BOILING

490. C. Corty and A. S. Foust, "Surface Variable in Nucleate Boiling," A.I. Ch. E. Preprint No. 1, Heat Transfer Symposium, St. Louis Annual Meeting (Dec. 1953).
491. C. Corty, "Surface Variables in Boiling," Univ. Microfilms, Pub. No. 3739, [Dissertation Abstr. 12, 460 (1952)], Abst. CA-47-2004e.
492. D. K. Edwards, "The Role of Interphase Mass Transfer in the Mechanism of Nucleate Boiling," Master of Science Thesis, Berkeley, University of California (1956).
493. E. Lieberman and W. E. Hopkins, "Program for the Investigation of Corrosion and Crud Deposition Under Nucleate Boiling," WAPD-A1W (PCh)-69.
494. M. T. McNelly, "A Correlation of the Rates of Heat Transfer to Nucleate Boiling Liquids," J. Imp. Coll. Chem. Eng. Soc. 7, 18-34 (1953), Abst. CA-48-13286c.
495. R. H. Sabersky and H. E. Mulligan, "On the Relationship Between Fluid Friction and Heat Transfer in Nucleate Boiling," Jet Propulsion 25, 1, 9-12 (Jan. 1955), Abst. App Mech Rev-9-1617.
496. K. Yamagata et al, "Nucleate Boiling of Water on the Horizontal Heating Surface," Reprint from Memoirs of the Faculty of Engineering, Kyushu U. 15, No. 1 (1955).
497. K. Yamagata et al, "Nucleate Boiling on Horizontal Heating Surface," Japan. Sci. Rev. 2, 409-20 (1952), Abst. CA-49-5b.

SURFACE EFFECTS

498. E. K. Averin, "The Effect of the Material and of the Mechanical Treatment of the Surface on the Heat Exchange in the Boiling of Water," [Trans. from Izvest. Akad. Nauk. S.S.S.R. Otdel. Tekh. Nauk. No. 3, 116-22 (1954)] AERE-Lib/Trans-562, Abst. NSA-9-7323.
499. E. K. Averin and G. N. Krughilin, "The Influence of Surface Tension and Viscosity on the Conditions of Heat Exchange in the Boiling of Water," [Trans. from Izvest. Akad. Nauk. S.S.S.R. Otdel. Tekh. Nauk. 10, 131-7 (1955)] AERE-Lib/Trans-682, Abst. NSA-10-6629.

500. W. B. Harrison et al, "Wetting Effects on Boiling Heat Transfer. Final Report for May 1, 1954 thru May 31, 1955," NP-5713, Abst. NSA-9-6246.
501. A. I. Morgan et al, "Effect of Surface Tension on Heat Transfer in Boiling," Ind. Eng. Chem. 41, 2767-9 (Dec. 1949), Abst. Sci A-53-2402.

TRANSIENTS

502. "Density Transients in Boiling Liquid Systems; Interim Report," AECU-2169 (1952).
503. M. L. Greenfield et al, "Studies on Density Transients in Volume-Heated Boiling Systems," AECU-2529 (1953).
504. R. P. Lipkis and N. Zuber, "Measurement and Prediction of Density Transients in a Volume-Heated Boiling System," Preprint No. 7, A. I. Ch. E. and ASME Heat Transfer Symposium (1955).
505. M. Richardson and L. G. Alexander, "Boiling Experiment Transient Effects," CF-55-1-104 (1955).
506. "Studies on Density Transients in Volume-Heated Boiling Systems. Final Report," AECU-2529 (1953).

III. BOILING HEAT TRANSFER

507. J. N. Addoms, "Heat Transfer at High Rates of Water Boiling Outside Cylinders," Thesis, Mass. Inst. of Tech., (Cambridge, Mass.) (1948).
508. G. A. Akin and W. H. McAdams, "Boiling: Heat Transfer in Natural-Convection Evaporator," Trans. Am. Inst. Chem. Engrs. 35, 137-58; Ind. Eng. Chem. 31, 478-91 (1939), Abst. CA-33-4471-2.
509. M. Baker et al, "Heat Transfer Film Coefficients for Refrigerants Boiling Inside Tubes," Refrig. Eng. 61, 986-91, (1953).
510. R. H. Baulk, "Heat Transfer from Submerged Surfaces to Boiling Liquids," Monthly Bull. Brit. Coal Utilization Research Assoc. 11, 185-92 (1947). [Dept. Sci. Ind. Research (Brit.), Fuel Abstracts 2, No. 6, 165 (1947)], Abst. CA-42-5202d.
511. E. F. Bogdanov, "Investigation on the Effect of Velocity of Flow of Water on the Heat Transfer Coefficient During Boiling in Inclined Tubes," Izvest. Akad. Nauk. S.S.S.R. Otdel. Tekh. Nauk. No. 4, 136-40 (1955).

512. W. E. Bonnet and J. A. Gerster, "Boiling Coefficients of Heat Transfer. C₄ Hydrocarbon-Furfural Mixtures Inside Vertical Tubes," Chem. Eng. Progr. 47, 151-8 (1951), Abst. CA-45-3662d.
513. L. Bromley, "Heat Transfer in Film Boiling from Horizontal Tube," BC-86 (1947).
514. L. A. Bromley, N. R. LeRoy and J. A. Robbers, "Heat Transfer in Forced Convection Film Boiling," Ind. Eng. Chem. 45, 2639-49 (1953), Abst. CA-48-2423g.
515. L. A. Bromley, "Heat Transfer in Stable Film Boiling," UCRL-122 (1948).
516. D. F. Casey, "Graphical Solutions of the Non-Boiling and Surface Boiling Heat-Transfer Equations," MTA-10 (1953), Abst. CA-48-412b.
517. H. Chelemer, "Effect of Gas Entrainment on the Heat Transfer Characteristics of Mercury under Turbulent Flow Conditions," ORO-139 (1955).
518. M. T. Cichell and C. F. Bonilla, "Heat Transfer to Liquids Boiling Under Pressure," Trans. Am. Inst. Chem. Engrs. 41, 755 (1945), Abst. CA-40-10692.
519. J. A. Clark and W. M. Rohsenow, "Local Boiling Heat Transfer to Water at Low Reynolds Numbers and High Pressures," Trans. Am. Soc. Mech. Engrs. 76, 553-62 (1954), Abst. CA-48-6751e.
520. R. A. Egen, D. A. Dingee, and J. W. Chastain, "Vapor Formation and Behavior in Boiling Heat Transfer," BMI-1163 (Feb. 1957).
521. M. E. Ellion, "A Study of the Mechanism of Boiling Heat Transfer," JPL-MEMO-20-88 (1954), Abst. NSA-9-4129.
522. E. A. Farber, "Heat Transfer to Water Boiling Under Pressure," Trans. Am. Soc. Mech. Engrs. 70, 369-84 (1948), Abst. CA-42-4006i.
523. F. C. Gunther and F. Kreith, "Photographic Study of Bubble Formation in Heat Transfer to Subcooled Water," JPL-Prog. Rept-4-120 (1950).
524. R. W. Jeffery, "Visual Study of Water Flowing Over A Flat Plate at High Rates of Heat Transfer with Surface Boiling," NP-4348 (1952).
525. G. A. Hawkins, "A Brief Review of the Literature on Boiling Heat Transfer," COO-23 (1950).
526. G. Henry et al, "Boiling Heat Transfer Project; Monthly Progress Report," AD-33232 (Jan. 1953).

527. M. Jakob, Heat Transfer, New York, Wiley (1949).
528. W. H. Jens, "Boiling Heat Transfer: What is Known About It," Mech. Eng. 76, 981-6 (1954), Abst. CA-49-1384c.
529. E. A. Kazakova, "Maximum Heat Transfer to Boiling Water at High Pressures," [Trans from Izvest. Akad. Nauk (U.S.S.R.) No. 9, 1377-87 (Sept. 1950) Engineers' Digest 12, 3, 81-5 (Mar. 1951),] Abst. Eng. Ind-1951-p.534.
530. E. Kirschbaum, "New Data on Heat Transfer with and without Change in State," Chem.-Ing.-Tech. 24, 393-400 (1952), Abst. CA-46-8906g.
531. J. W. Knowles, "Heat Transfer with Surface Boiling," Can. J. Research 26A, 268-78 (1948), Abst. CA-42-8540g.
532. F. Kreith and M. Summerfield, "Heat Transfer with Surface Boiling," JPL-PR-4-68 (1948).
533. G. N. Kruzhilin, "Heat Transmission from a Heating Surface to a Boiling One-Component Liquid at Free Convection," Trans. from Izvest. Akad. Nauk. S.S.S.R. Otdel. Tekh. Nauk., 967-80 (1948) AEC-TR-2060, Abst. NSA-9-1810.
534. S. S. Kutateladze, "Hydromechanical Model of the Critical Condition of Heat Transfer in Boiling Liquids for the Case of Free Convection," [Trans. from Zhur. Tekh. Fiz. 20, 1389-92 (1950)] AEC-TR-1858, Abst. NSA-8-3338.
535. R. F. Laroon, "Factors that Influence Heat Transfer in Boiling," CF-52-8-178 (1952).
536. S. M. Lukomskii, "Heat Transfer in Boiling," Izvest. Akad. Nauk. S.S.S.R. Otdel. Tekh. Nauk., 1753-66 (1946), Abst. CA-41-3359b.
537. S. M. Lukomskii, "A Method for Approximating the Heat Transfer in Boiling," Khim. Prom. 6, 9-14 (1944), Abst. CA-39-654-7.
538. W. H. McAdams et al, "Heat Transfer at High Rates to Water with Surface Boiling," ANL-4268 (1948).
539. A. G. Monroe, H. A. S. Bristow, and J. E. Newell, "Heat Transfer to Boiling Liquids at Low Temperatures and Elevated Pressures," J. Appl. Chem. 2, 613-24 (1952).
540. J. Moss, "Heat Transfer-Conduction; Heat Transfer Between Fluids and Surfaces; Fluidized Beds; Heat Exchangers, Boiling and Condensation; Radiation; Gas Turbines; Rockets; Induction Heating; Analog Methods," Chem. & Process Eng. 33, 603-6 (1952), Abst. CA-47-925c.

541. J. F. Mumm, "Heat Transfer to Boiling Water Forced Through a Uniformly Heated Tube," ANL-5276(1954), Abst. NSA-9-1804.
542. E. L. Piret, "Two Phase Heat Transfer in Natural Circulation Evaporation," Am. Inst. Chem. Eng. Heat Transfer Symposium (St. Louis, Mo.), Paper No. 4 (1953).
543. M. S. Plesset and S. A. Zwick, "A Nonsteady Heat Diffusion Problem with Spherical Symmetry," J. Appl Phys. 23, 95-8 (1952), Abst. App Mech Rev-5-1874.
544. F. H. Rhodes and C. H. Bridges, "Heat Transfer to Boiling Liquids," Ind. Eng. Chem. 30, 1401-6 (1938), Abst. CA-33-1181-1.
545. J. E. Rhodes, "Heat Transfer to a Boiling Liquid," Am. J. Phys. 21, 67-70 (Jan. 1953), Abst. Sci A-56-3232.
546. W. M. Rohsenow and J. A. Clark. "Heat Transfer and Pressure Drop Data for High Heat Flux Densities to Water at High Subcritical Pressures," NP-3385 (1951), Abst. NSA-6-7070.
547. W. M. Rohsenow and J. A. Clark. "The Mechanism of Boiling Heat Transfer," Trans. Am. Soc. Mech. Engrs. 73, 609-20 (1951), Abst. CA-45-6881f.
548. W. M. Rohsenow, "A Method of Correlating Heat-Transfer Data for Surface Boiling of Liquids," Trans. Am. Soc. Mech. Engrs. 74, 969-76 (1952), Abst. CA-46-8426e.
549. W. M. Rohsenow and J. A. Clark, "Study of the Mechanism of Boiling Heat Transfer," Trans. Am. Soc. Mech. Engrs. 73, 609-20 (1951).
550. W. M. Rohsenow and J. A. Clark, "Technical Report No. 4 on Local Boiling Heat Transfer to Water at Low Reynolds Numbers and High Pressure," NP-4112 (July 1952).
551. F. Rumford, "Heat Transfer Through Boiling Liquid Films," J. Soc. Chem. Ind. 66, 309-12 (1947), Abst. Sci A-51-1224.
552. L. S. Stermann, "Investigation of Heat Exchange by Boiling Liquids in Tubes," [Trans. from Zhur. Tekh. Fiz. 24, 2046-53 (1954)] AERE-Lib/Trans-565, Abst. NSA-9-1238.
553. L. S. Stermann, "On the Theory of Heat Exchange on Boiling in Pipes," Trans. from Zhur. Tekh. Fiz. 24, No. 2, 250-7 (1954) AERE-Lib/Trans-579, Abst. Sic A-58-9603.
554. N. G. Syushchin and L. S. Stermann, "The Effect of Velocity of Motion of a Fluid on Heat Transfer During Boiling," [Trans. from Zhur. Tekh. Fiz. 21, 448-52 (1951)] AEC-TR-1781, Abst. NSA-8-1860.

555. V. N. Tramontini et al, "Final Report on Studies in Boiling Heat Transfer," COO-24 (March, 1951).
556. J. E. Viscardi, "Reactor Heat Transfer Progress No. 9," NDA-26 (1956), Abst. NSA-11-1848.
557. J. E. Viscardi, "Reactor Heat Transfer Progress No. 10," NDA-28 (1956).
558. J. E. Viscardi, "Reactor Heat Transfer Progress No. 12," NDA-30 (1956), Abst. NSA-11-1849.
559. J. E. Viscardi, "Reactor Heat Transfer Progress No. 12," NDA-31 (1956).
560. J. E. Viscardi, "Reactor Heat Transfer Progress No. 13," NDA-33 (1957).
561. J. E. Viscardi, "Reactor Heat Transfer Progress No. 13," NDA-35 (1957).

IV. LIQUIDS

562. T. Asanii, "The Fracture Mechanism of Liquids," Busseiron Kenkyu (Researches on Chem. Phys.) No. 57, 54-62 (1952), Abst. CA-47-1448f.
563. T. Asanii, "Negative Fracture-Pressure of Liquids," Busseiron Kenkyu (Researches on Chem. Phys.) No. 57, 26-32 (1952), Abst. CA-46-10740i.
564. J. Frenkel, Kinetic Theory of Liquids, London, Oxford Univ. Press (1946).
565. R. Furth, On the Theory of the Liquid State, Proc. Cambr. Phil. Soc. 37, 252-257 (1941).
566. R. Furth, "Theory of the Liquid State. I. The Statistical Treatment of Thermodynamics of Liquids by the Theory of Holes. II. Application of the Hole Theory to Supersaturated Liquids and Supersaturated Solutions of Gases in Liquids," Proc. Cambr. Phil. Soc. 37, 252-80 (1941), Abst. CA-35-7255-3.
567. F. B. Kenrick, C. S. Gilbert, and K. L. Wismer, "Superheating of Liquids," J. Phys. Chem. 28, 1297 (1924), Abst. CA-19758-5.
568. H. Lamb, Hydrodynamics, 6th Ed., London, Cambridge Univ. Press (1932).
569. M. S. Plesset, "Note on the Flow of Vapor Between Liquid Surfaces," J. Chem. Phys. 20, 790-793 (1952), Abst. CA-47-2005a.

570. L. A. Smith et al, "Hot Channel Flow Behavior," NRTF-ER-39 (1955).

571. W. A. Weyl and E. C. Marboe, "Some Mechano-Chemical Properties of Water," Research (London) 2, 19-28 (1949), Abst. CA-43-3682c.

SUPERSATURATION

572. N. D. Clare, "Supersaturation of Gases in Liquids," Trans. Roy. Soc. Can. III (3) 9, 32-33 (1925), Abst. CA-20-319-9.

VISCOSITY EFFECTS

573. R. O. Davies, "A Discussion on the First and Second Viscosities of Fluids: A Note on Sir Geoffrey Taylor's Paper," Proc. Roy. Soc. (London) A226, 39 (1954), Abst. Sci A-58-85.

574. G. Taylor, "A Discussion on the First and Second Viscosities of Fluids: The Two Coefficients of Viscosity for an Incompressible Fluid Containing Air Bubbles," Proc. Roy. Soc. (London) A226, 34-37 (1954), Abst. Sci A-58-83.

575. G. Taylor, "A Discussion on the First and Second Viscosities of Fluids; Note on the Volume Viscosity of Water Containing Bubbles," Proc. Roy. Soc. (London) A226, 38-39 (1954), Abst. Sci A-58-84.

V. BUBBLE CHAMBERS

576. P. E. Argan and A. Gigli, "A New Detector of Ionizing Radiation. The Gas Bubble Chamber," Nuovo cimento 3, #5, 1171-2 (1956).

577. J. L. Brown, "Liquid Xenon Bubble Chamber," Phys. Rev. 102, 586-7 (1956).

578. H. C. Dittler and T. F. Gerecke, "Liquid Hydrogen Bubble Chamber," UCRL-2985 (1955).

579. D. A. Glaser, "Bubble Chamber Tracks of Penetrating Cosmic-Ray Particles," Phys. Rev. 91, 762-3 (1953).

580. D. A. Glaser, D. C. Rahm, and C. Dodd, "Bubble Counting for the Determination of the Velocities of Charged Particles in Bubble Chambers," Phys. Rev. 102, 1653-8 (1956).

581. D. A. Glaser and D. C. Rahm, "Characteristics of Bubble Chambers," Phys. Rev. 97, 474-479 (1955).

582. R. H. Hildebrand and D. E. Nagle, "Operation of a Glaser Bubble Chamber with Liquid Hydrogen," Phys. Rev. 92, 517-8 (1953).
583. D. E. Nagle et al, "Hydrogen Bubble Chamber Used for Low Energy Meson Scattering," Rev. Sci Instr. 27, 203-7 (1956).
584. W. Willis, E. C. Fowler, and D. C. Rahm, "Bubble Density in a Propane-Bubble Chamber," Bull. Amer. Phys. Soc., II, 2, #1, (1957).
585. J. G. Wood, "Bubble Tracks in a Hydrogen-Filled Glaser Chamber," Phys. Rev. 94, 731 (1954).

VI. FOAMS

586. H. M. Cassel, "Physical Aspects of Foaming in Steam Generation," J. Appl. Phys. 15, 792-798 (1944).
587. R. C. Chang, "Aqueous Foams; Bubble Size and Bubble Size Determination," Ind. Eng. Chem. 48, 2035-9 (1956).
588. W. Philippoff, "Some Dynamic Phenomena in Flotation," Trans. Am. Inst. Mining Met. Engr. Tech. Pub. No. 3265-B (In Mining Eng. 4, 386-90, 1952), Abst. CA-46-4443d.
589. K. L. Suterland, "Physical Chemistry of Flotation XI: Kinetics of the Flotation Process," J. Phys. and Colloid Chem. 52, 394-425 (1948), Abst. CA-42-2836h.

VII. STEAM

590. W. S. Brown, "Unsteady State Flow of Steam from A High Pressure System," ORNL-1604 (1953), Abst. NSA-8-2166.
591. M. A. Styrikovich and G. E. Kholodovskii, "An Investigation of Circulation in Steam-Generating Tubes at High Steam Pressures," [Trans. from Izvest. Akad. Nauk. S.S.S.R. Otdel. Tekh. Nauk., 506-28 (1951),] AEC-TR-1433, AEC-TR-1440, WO-27629.

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