

**SELECTED REFERENCES  
ON  
ALKALIC IGNEOUS ROCKS  
OF THE UNITED STATES**

U. S. ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION  
Division of Nuclear Fuel Cycle and Production  
Washington, D. C. 20545

**MASTER**

**USA**

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The major purposes of this bibliography are first to present a compilation of references providing background information on rock and mineral associations, geochemistry, geophysics, structural relationships, and geochronology of sialic, feldspathoidal, and some mafic alkalic igneous rock exposures in the United States and second, to cite their locations and major characteristics. Where available, references to uranium content in these rocks have been included; however, no implication regarding uranium potential in these areas is intended. A few references on uranium have also been included with respect to igneous rocks that might be more correctly classified as non-alkaline.

The bibliography consists of three parts. The first part provides general references to overall features of alkaline igneous rocks in the United States by region, as well as general background information on alkaline magmatic differentiation, the role of volatiles, etc. The second part is a compilation of references on alkalic igneous rocks by state or groups of states. The third part provides information on rock type, age, and location for most of the references cited in part two. The format in which the data of part three are presented is as follows:

1. Province

Names for provinces given in the summary have either been taken directly from the literature, or where no name was given, have been named for a county, nearby town, or physiographic feature.

2. Location Coordinates

In some instances sufficient information was available to accurately determine latitude and longitude for a given province. In most cases, however, the locations are only approximate and represent an attempt to position the province as accurately as possible within the given state. West longitude is presented first, followed by north latitude.

3. Igneous Body and Rock Type

The extrusive or intrusive classification of the igneous body is given and, where available, data are furnished with respect to rock constituents.

#### 4. Age

The approximate isotopically determined age of the rocks is given where such data are available. Where specific ages are not available, the rock may in some cases be classified according to geologic era or period.

\* \* \*

The majority of the location citations and data summaries have been compiled directly from the literature as referenced by state, with D. S. Barker's "Alkaline Rocks of North America," Table 1 (see general bibliography) having served as a principal data source and guide for presentation.

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Arkansas - Louisiana - Mississippi

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Arkansas - Louisiana - MississippiArkansas

Brazil Branch 92°45', 35°  
 fragments in intrusive breccia; nepheline syenite, shonkinite

Little Rock-Fourche Mtn. District 92°05', 34°35'  
 pluton; nepheline syenite, syenite  
 88 m.y.

Magnet Cove 93°, 34°30'  
 ring dike, zoned stock; syenite, phonolite  
 97 m.y.

Perkins and White, Lee No. 1 Well 91°, 35°  
 flow, pyroclastic; phonolite

Potash Sulfur Springs 93°05', 34°30'  
 ring dike, zoned stock; carbonatite, syenite  
 98 m.y. ?

Louisiana - Mississippi

Jackson Dome 90°, 32°15'  
 flow, pyroclastic; nepheline syenite ?, phonolite  
 late Cretaceous

Monroe Uplift 91°, 33°  
 flow, pyroclastic; nepheline syenite ?, phonolite, tinguaitite  
 late Cretaceous

Illinois - Kentucky - Missouri

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Illinois - Kentucky - MissouriIllinois

Hicks Dome and Illinois-Kentucky Fluorspar District

88°30', 37°30'  
 diatremes, dikes, sills; kimberlite, lamprophyre, syenite  
 26 m.y.

Kentucky

Dike-Eaton  
 dike; lamprophyre

88°10', 37°15'

Elliott County  
 diatreme; kimberlite  
 269 m.y.

88°5', 38°5'

Missouri

Avon  
 diatreme; kimberlite  
 post-Devonian

90°17', 37°45'

Michigan - Minnesota - Wisconsin

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Michigan - Minnesota - WisconsinMichigan

Baraga County 88° 15' , 46° 40'  
 dike; lamprophyre

Minnesota

Dead River 91° 58' , 47° 57'  
 pluton; lamprophyre

Snowbank 91° 30' , 48°  
 dike, stock; lamprophyre, syenite, syenodiorite  
 2,600 m.y. (lamprophyre), 2,700 m.y. (syenodiorite)

Wisconsin

Wausau 89° 45' , 45° 5'  
 dike, pluton; nepheline syenite, syenite  
 Precambrian

New England

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New EnglandConnecticut - Massachusetts - Rhode Island

Blue Hill 71°05', 42°15'  
batholith; aporhyolite, riebeckite granite  
early Paleozoic

Cape Ann 70°40', 42°40'  
batholith; ferrohastingsite granite  
255 m.y.

Cumberland - Copper Mine Hill 71°29', 41°59'  
pluton; riebeckite porphyry  
mid-Pennsylvanian

Essex County 70°50', 42°33'  
pluton; riebeckite granite, syenite  
440 m.y.

Peabody 70°50', 42°30'  
ferrohastingsite granite  
270 m.y.

Quincy 71°, 42°30'  
batholith; aporhyolite, riebeckite granite  
280 m.y.

Rattlesnake Hill 71°10', 42°05'  
pegmatite ? ; riebeckite granite  
pre-Triassic

Maine

Burnt Meadow Mountain 70°30', 44°30' ?  
quartz syenite, syenite  
Mesozoic

Cashes Ledge 68°56', 42°54'  
riebeckite granite

Deboullie District 68°50', 46°58'  
stock; syenite  
lower Devonian

Litchfield 69°50', 44°15'  
pegmatite, ring dike; syenite  
242 m.y.

Mt. Agamenticus 70°40', 43°12'  
 stock; aegirine granite, syenite  
 227 m.y.

Pleasant Mountain 70°50', 44°  
 stock; analcite syenite

New Hampshire

Alton 71°15', 43°25'  
 ring dike; quartz syenite

Belknap Mountains 71°25', 43°30'  
 ring dike; quartz syenite  
 177 m.y.

Ossipee 71°15', 43°45'  
 ring dike, volcanics; quartz syenite  
 114 m.y. ?

Pliny Range 71°25', 44°30'  
 ring dike, stock; syenite  
 212 m.y.

Red Hill 71°30', 43°45'  
 ring dike, stock; nepheline syenite  
 mid-Triassic

South Pond 71°20', 44°38'  
 ring dike; alkali granite, quartz syenite  
 post-Ordovician

White Mountain 72°, 43°45'  
 dike, stock; riebeckite granite, syenite  
 180 m.y.

Vermont

Ascutney Mountain 72°25', 43°25'  
 stock; syenite  
 195 m.y.

Barber Hill 73°20', 44°15'  
 stock; syenite  
 111 m.y.

Burke	72° , 44° 30'
dike; lamprophyre	
100 m.y.	
Cuttingsville	72° 50' , 43° 30'
stock; sodalite-nepheline syenite	
100 m.y. ?	
Grand Isle	73° 20' , 44° 40'
dike; lamprophyre, syenite	
136 m.y.	
Mt. Monadnock	71° 32' , 44° 54'
stock; essexite, lamprophyre, quartz syenite	
Mississippian ?	



New Jersey - New York - Pennsylvania

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New Jersey - New York - PennsylvaniaNew Jersey

Beemerville  $74^{\circ}42'$ ,  $41^{\circ}14'$   
 dike, plug, stock; bostonite, mafic syenite, nepheline syenite  
 434 m.y.

Brookville  $74^{\circ}57'$ ,  $40^{\circ}24'$   
 sill; analcite syenite, nepheline syenite  
 late Triassic

Cranberry Lake  $74^{\circ}40'$ ,  $40^{\circ}55'$   
 dike; pegmatite  
 Precambrian

Mount Gilboa  
 syenite

New York

Diana  $75^{\circ}27'$ ,  $44^{\circ}$   
 dike, sill, stratiform sheet; augite syenite, quartz syenite  
 Precambrian

Lake Champlain Valley  $73^{\circ}50'$ ,  $44^{\circ}10'$   
 dike, lamprophyre  
 136 m.y. ?

Lake George  $73^{\circ}45'$ ,  $43^{\circ}25'$   
 syenite

Manheim  $74^{\circ}45'$ ,  $43^{\circ}5'$   
 dike; kimberlite  
 145 m.y.

New York City  $73^{\circ}50'$ ,  $40^{\circ}52'$   
 dike; lamprophyre  
 Precambrian

Portland Point  $76^{\circ}30'$ ,  $42^{\circ}25'$   
 dike; kimberlite  
 136 m.y. ?

Santa Clara  $74^{\circ}23'$ ,  $44^{\circ}39'$   
 stratiform sheet; quartz syenite  
 Precambrian

Tupper-Saranac 74° 25', 44° 10'  
batholith, dike, migmatite; quartz syenite  
Precambrian

Pennsylvania

Dixonville 79°, 40° 45'  
dike; kimberlite

Masontown 79° 55', 39° 50'  
diatreme; kimberlite  
early Cretaceous

North Carolina - Tennessee - Virginia

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North Carolina - Tennessee - VirginiaNorth Carolina

Mount Rogers  $81^{\circ}30'$ ,  $36^{\circ}30'$   
 flow, pluton; rhyolite, riebeckite granite  
 late Precambrian

Spruce Pine District  $82^{\circ}4'$ ,  $35^{\circ}55'$   
 sill; alaskite  
 Paleozoic

Tennessee

Bateman No. 1 Well  $90^{\circ}$ ,  $35^{\circ}15'$   
 nepheline syenite  
 late Cretaceous

Robroy-MacGregor No. 1 Well  $89^{\circ}45'$ ,  $35^{\circ}30'$   
 nepheline syenite  
 late Cretaceous

Virginia

Augusta County (Mt. Solon - Mossy Creek - Staunton)  $79^{\circ}$ ,  $38^{\circ}15'$   
 dikes; camptonite, nepheline syenite, syenite  
 149 m.y. - Triassic

Berea  $77^{\circ}33'$ ,  $38^{\circ}22'$   
 pluton; quartz monzonite

Great Falls  $77^{\circ}15'$ ,  $39^{\circ}$   
 dike; lamprophyre  
 mid-Devonian

Mt. Horeb  $79^{\circ}30'$ ,  $37^{\circ}45'$   
 kimberlite

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Alaska

Bokan Mountain pluton; peralkaline granite 440 m.y.	132°10', 54°55'
Chichagof Island pluton; syenite >400 m.y.	135°, 57°45'
Granite Mountain stock; syenite pre-Cretaceous	161°15', 65°30'
Selawik Hills pluton; syenite 107 m.y.	160°, 66°15'
St. Lawrence Island epizonal pluton, float; nepheline syenite mid-Cretaceous 100 m.y.	170°10', 63°18'

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Arizona

Hopi Buttes and Navajo Country 109°45' -110°, 35°20' -37°  
breccia pipe, diatreme, dike, flow, sill; analcite basalt,  
nepheline trachybasalt, olivine leucitite  
Pliocene

Tuba Dike - Cameron 111°28', 35°50'  
breccia pipe, dike; lamprophyre

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California

Bald Mtn. - Burnt Mtn. pluton; bostonite, syenite Eocene ?	105°27', 40°3'
Deep Spring Valley plug; leucite, trachybasalt	118°, 37°15'
Lassen Volcanic National Park pyroclastic, volcanic; dacite, trachyte	121°30', 40°30'
Malapai Hill stock; alkali olivine basalt late Cenozoic	116°, 34°
Mountain Pass dike, pluton; carbonatite, shonkinite 1,400 m.y.	115°30', 35°30'
Murietta dike; nepheline basalt Quaternary	117°10', 33°34'
New Idria pluton; syenite	120°34', 36°18'
San Gabriel massif; anorthosite, syenite 1,220 m.y.	118°15', 34°22'
Tin Mountain pluton; nepheline syenite	117°30', 37°
Yosemite National Park dike; alaskite	119°30', 37°45'

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Colorado

- Cripple Creek 105°08', 38°44'  
flow, plug, pyroclastic; analcite syenite, soda syenite  
34 m.y.
- Elk Mountain 107°, 38°50'  
dike, sill, stock; alaskite, lamprophyre, sodic granite  
upper Cenozoic
- Eureka Gulch - Central City District 105°31', 39°49'  
dike; quartz bostonite  
Tertiary
- Front Range 105°30', 39°45' -41°  
dike, pluton; alaskite, bostonite, syenite  
diatreme; kimberlite  
early Tertiary
- Iron Hill 107°10', 38°30'  
funnel; carbonatite, nepheline syenite  
1,480 m.y.
- La Plata 108°06', 37°25'  
dike, sill; syenite  
120 m.y.
- Mount Rosa 104°45', 38°45'  
sill; lamprophyre, riebeckite granite, syenite  
1,040 m.y.
- Ralston Buttes 105°20', 39°40'  
dike; leucosyenite; Laramide  
dike, sill; biotite syenite, lamprophyre; pre-Pennsylvanian
- San Juan Mountain - Ute Creek 106°30' -107°24', 37°15' -38°  
stock; melasyenite  
dike; alaskite, lamprophyre, nepheline-soda syenite  
1,400 m.y.
- South Park 105°45', 39°  
dike, sill; analcite syenite  
post-Cretaceous pre-Oligocene
- Spanish Peaks 104°46' -104°54', 37°22' -37°37'  
dike; lamprophyre, melasyenite  
stock; syenodiorite  
Tertiary
- Ute Mountains 108°50', 37°15'  
dike, sill; lamprophyre  
late Cretaceous

Idaho-Oregon-Washington

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Idaho - Oregon - WashingtonIdaho

Ramey Ridge 115°15', 45°15'  
 pluton; syenite, quartz syenite  
 Paleozoic

Oregon

Blodgett Peak-Table Mtn. - Cannibal Mtn. 123°50', 44°30'  
 sill, stock; nepheline syenite porphyry  
 late Eocene

Cougar Mountain 123°50', 44°55'  
 dike, sill, stock; camptonite  
 late Miocene

Siletz River 123°45', 44°30'  
 flow, breccia; alkali basalt  
 Eocene

Washington

Golden Horn 121°, 48°30'  
 batholith; riebeckite granite  
 Eocene

Marble 117°51', 48°51'  
 dike, plug; lamprophyre  
 Tertiary

Mount Kruger 119°37', 49°  
 dike, pluton; nepheline syenite, shonkinite  
 Triassic - Oligocene

Rock Creek 119°05', 49°  
 flow, pluton; analcite phonolite  
 post early Oligocene

Shasket Creek 118°33', 48°58'  
 dike, plug; nepheline syenite, syenite porphyry, shonkinite  
 Cretaceous ?

Kansas

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Kansas

Bala dike; kimberlite 115 m.y.	96°58', 39°20'
Leonardville dike; kimberlite 100 m.y.	96°54', 39°23'
Randolph pipe; kimberlite 100 m.y.	96°47', 39°31'
Stockdale pipe; kimberlite 100 m.y.	96°47', 39°23'
Winkler Crater pipe; kimberlite 195 m.y.	96°49', 39°29'
Rose, Silver City and Neosho domes dike; kimberlite 90 m.y.	37°43', 95°39'

Montana

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Montana

- Bearpaw Mountains 109°30', 48°10'  
dike, flow, laccolith, sill; carbonatite, nepheline syenite  
52 m.y.
- Big Belt Mountains 112°, 47°10'  
dike, flow, laccolith, sill; quartz latite
- Black Butte 109°, 47°55'  
diatreme; lamprophyre  
mid-Tertiary
- Boulder Batholith (margin) 112°10', 46°35'  
dike, stock; alaskite, shonkinite, syenodiorite  
70 m.y.
- Castle Mountains 110°45', 46°30'  
dike, laccolith, sill; aegirine-riebeckite trachyte
- Crazy Mountains 110°15', 46°  
dike, laccolith, sill; nepheline syenite, syenite
- Highwood Mountains 110°30', 47°30'  
dike, laccolith, sill; nepheline syenite, shonkinite, syenite
- Judith Mountains 109°10', 47°10'  
dike, laccolith, sill; analcite syenite, syenite  
50 m.y.
- Little Belt Mountains 110°45', 47°  
dike, sill, laccolith; analcite-nepheline syenite,  
quartz syenite  
45 m.y.
- Little Rocky Mountains 108°30', 48°  
dike, laccolith, sill; lamprophyre, quartz syenite, syenite
- Moccasin Mountains 109°40', 47°10'  
dike, laccolith, sill; aegirine-riebeckite quartz syenite
- Rainy Creek 115°30', 48°30'  
dike, stock; nepheline syenite, syenite  
94 m.y.
- Sweet Grass Hills 111°30', 49°  
dike, laccolith, sill; phonolite, syenite

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Nevada - UtahNevada

Black Mountain - Silent Canyon Nye Co. pyroclastic; comendite, pantellerite glass mid-Pliocene	116° 20', 37° 20'
Black Rock Nye Co. flow; alkali basalt	116°, 38° 28'
Humboldt Co. flow; comendite, pantellerite late Tertiary	119°, 41° 30'
Mount Wheeler stock; quartz monzonite	114° 15', 38° 56'
Red Rock dike; allanite pegmatite	119° 30', 39° 40'
Shoshone Range breccia pipe; quartz monzonite Tertiary	116° 50', 40° 30'
Silver Peak dike, flow, plug; latite Pliocene - Holocene	117° 50', 37° 45'
<u>Utah</u>	
Cane Valley - Moses Rock - Mule Ear - Red Mesa diatreme, pipe; carbonatite, kimberlite post-Pliocene	109° 43', 37° 10'
La Sal Mountains dike, laccolith, stock; sodalite syenite, syenite porphyry 25 m.y.	109° 10', 38° 30'
Marysvale agglomerate, dike, plug, pyroclastic; Tertiary	112° 15', 38° 25' andesite, latite, quartz monzonite
Moon Canyon - Park City District dike, flow, plug; phlogopite-diopside-analcite, kimberlite upper Eocene - lower Pliocene	111° 10', 40° 45'



Navajo Mountain pluton; syenite porphyry Tertiary	110°50', 37°2'
San Rafael Swell dike, plug, sill; analcite diabase, analcite syenite	111°, 39°
Thomas Range flow, pipe; alkali rhyolite late Tertiary - Quaternary	113°7', 39°50'
West Tintic and Sheeprock Mountains breccia pipe; latite, monzonite Tertiary	112°21', 39°51'

New Mexico - Oklahoma - Texas

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New Mexico - Oklahoma - TexasNew Mexico

- Capitan Mountain  $105^{\circ}40'$ ,  $33^{\circ}37'$   
dike, sill; alaskite
- Cornudas Mountains and Diable Plateau  $105^{\circ}30'$ ,  $32^{\circ}$   
dike, laccolith, sill; analcite-nepheline syenite,  
quartz syenite  
28-43 m.y. ?
- Pajarito Mountain  $105^{\circ}26'$ ,  $33^{\circ}14'$   
quartz syenite, syenite  
1,170 m.y.
- Pleasant Mountain  $104^{\circ}$ ,  $36^{\circ}30'$   
dike, flow, sill; alkali-olivine basalt, phonolite  
Holocene
- Sacramento Mountains  $105^{\circ}40'$ ,  $32^{\circ}50'$   
dike, sill; camptonite, lamprophyre  
44 m.y.
- Sandia Mountains  $107^{\circ}$ ,  $35^{\circ}$   
dike; lamprophyre  
post-Cretaceous
- Sierra Blanca  $105^{\circ}30'$ ,  $33^{\circ}30'$   
stock; syenite  
mid-Tertiary

Oklahoma

- Headquarters and Wichita Mountains  $99^{\circ}$ ,  $34^{\circ}45'$   
pluton; riebeckite granite  
525 m.y.

Texas

- Christmas Mountains  $103^{\circ}27'$ ,  $29^{\circ}25'$   
dike, sill; aegirine-riebeckite rhyolite, analcite syenite  
Tertiary
- Davis - Barrilla Mountains  $103^{\circ}30'$  -  $104^{\circ}15'$   
 $29^{\circ}45'$  -  $31^{\circ}$   
dike, flow, laccolith, plug, sill;  
aegirine-riebeckite granite and rhyolite, alkalic  
microsyenite, nepheline syenite, syenite  
post-Oligocene

Enchanted Rock  $98^{\circ}50'$ ,  $30^{\circ}35'$   
 batholith; alkalic granodiorite, leucogranite  
 815 m.y.

Solitario  $102^{\circ}45'$ ,  $29^{\circ}30'$   
 dike, plug, sill; analcite syenite

Terlingua - Big Bend  $103^{\circ}40'$ ,  $29^{\circ}20'$   
 dike, flow, plug, sill; aegirine-riebeckite granite  
 and rhyolite, analcite syenite

Uvalde County - Balcones Fault Zone  $97^{\circ}-100^{\circ}30'$ ,  
 $28^{\circ}30'-31^{\circ}15'$   
 dike, flow, laccolith, plug, sill; analcite phonolite  
 70 m.y.



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South Dakota - Wyoming

Black Hills - Devil's Tower - Missouri Buttes

103°45' - 104°, 44°20' - 44°35'  
 laccolith, plug, sill; nepheline syenite, quartz syenite,  
 syenite  
 50 m.y.

Wyoming

Granite Mountain  
 biotite granite  
 2,800 m.y.

107°40', 42°40'

Heaths Peak  
 cupola; syenitic granite  
 Precambrian

106°55', 42°20'

Laramie  
 zoned stock; hornblende syenite, hypersthene syenite  
 1,340 m.y.

105°20', 41°50'

Laramie Range  
 diatrema; kimberlite  
 late Silurian

105°28', 41°

Leucite Hills  
 dike, flow, plug, pyroclastic; leucite-phlogopite-iron glass  
 1 m.y.

109°, 42°