

The effect of H₂S on the performance of a hydrogen separation membrane with the composition Pd₄Pt was evaluated at 350, 400 and 450°C. Exposure to hydrogen containing 1000 ppm H₂S and 10%He resulted in two performance trends. At 350°C, a continuous decline in flux was observed which was attributed to the growth of sulphide corrosion on the membrane surface linked to surface contamination by stainless steel derived particles. At 400 and 450°C, the H₂ flux decreased sharply followed by a slow recovery. This trend was attributed to Pt enrichment of the surface resulting from extraction of Pd through the formation of Pd₄Pt. Also at 400 and 450°C, stainless steel based particle contamination was found to modify and/or enhance the corrosive effects of the H₂S containing test gas. The implications of the metallic and/or metal sulphide surface contaminant effects are significant in that these contaminants could result in severe performance degradation and ultimately even mechanical failure.