

OXYGEN REDUCTION ON GOLD ALLOYS OF
PLATINUM, PALLADIUM, AND SILVER

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Gold alloys of platinum, palladium and silver were prepared in which the composition varied by increments of 10% from 10 - 90% gold. They were examined as rotating electrodes for activity in the cathodic reduction of oxygen in 2 N potassium hydroxide at 25°C.

The activity of the Au/Ag alloys decreased progressively as the silver content was increased; the Au/Pt alloys showed an almost constant activity over the whole composition range; the Au/Pd alloys, however, showed a broad maximum of activity (greater than that of the Au/Pt alloys) over the composition range 70 - 20% Au. The order of activity of the pure metals at low polarization was Pd > Pt = Au > Ag.

The extent of oxygen film formation on each of the alloys was determined by fast potential sweep techniques, this information is used in the interpretation of the observed activities. Selected measurements were made at 75°C, the pattern of activity was substantially the same at 25°C. In the experimental work care was taken to ensure that the bulk alloy composition was preserved at the surface for all measurements. Variations in surface roughness were taken into account by measurement of double layer capacities using a triangular potential sweep.