

Thermal and Electrical Conductivities of Electroplated Gold*

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Thermal conductivity of electroplated gold at cryogenic temperatures is an important parameter for predicting the thermal behavior of ignition holraums that will eventually be fielded on the National Ignition Facility. We have measured the ratios between the electrical conductivities at 4.2 K and room temperature for electroplated gold as a function of bath parameters and plating current density. By using the Wiedemann-Franz law we predict thermal conductivities of these samples. We find that even small amounts of bath brightener drastically reduce the conductivities, and that the conductivities have only a weak dependence on plating current density.

*Work supported by U.S. Department of Energy under Contract DE-AC03-01SF22260.