

Note

A simple a.c. electrical conductivity (EC) sample holder for use to 1000°C

W. W. WENDLANDT

Department of Chemistry, University of Houston, Houston, Texas 77004 (U.S.A.)

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A convenient a.c. electrical conductivity (EC) apparatus for use up to about 500°C has previously been described by Wendlandt¹. The sample, in the form of a pressed disk, was placed between two platinum plates (electrodes) which were situated in a small cylindrical furnace. A 1–10 V, 100 Hz potential was applied to the electrodes and the resulting current, in μA , was recorded on an *X-Y* plotter as a function of furnace temperature, T_f . We wish to describe here a modification of this apparatus so that EC measurements can be made on pressed disks of sample up to a temperature of 1000°C.

EXPERIMENTAL

EC apparatus

The sample holder and furnace arrangement are illustrated in Fig. 1.

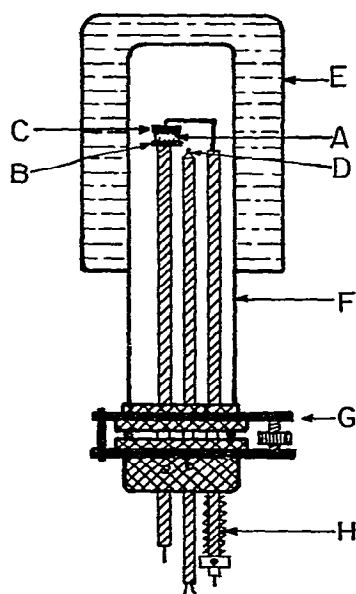


Fig. 1. EC sample holder and furnace arrangement. A, sample; B and C, electrodes; D, furnace thermocouple; E, furnace; F, Vycor tube; G, clamp; and H, spring.

The sample A, in the form of a pressed disk (1.0 mm \times 5.0 mm), is placed between two platinum electrodes (7.0 mm in diameter). Leads to the electrodes are led out of the furnace area by 3 mm in diameter one-holed ceramic insulator tubes. To maintain a constant tension on the sample disk by the electrodes, one electrode is spring loaded at H.

The furnace consists of a Nichrome resistance wire heater element wound on a Vycor tube, 25 mm in diameter, and suitably insulated with a ceramic material. A clamp G secures the tube furnace to the base. Furnace temperature, T_f , is detected by a Chromel–Alumel thermocouple located at D. The other components of the EC apparatus are the same as those previously described¹.

The apparatus can be used on pure samples, compressed in the form of disks, or of a matrix mixture with KCl, KBr or KI. It has been used routinely up to temperatures of 1000°C.

ACKNOWLEDGMENT

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REFERENCES

- 1 W. W. Wendlandt, *Thermochim. Acta*, 21 (1977) 291.