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"IN-SITU" INFRARED SPECTROSCOPY OF ELECTRODE SURFACES WITH A SYNCHROTRON SOURCE*

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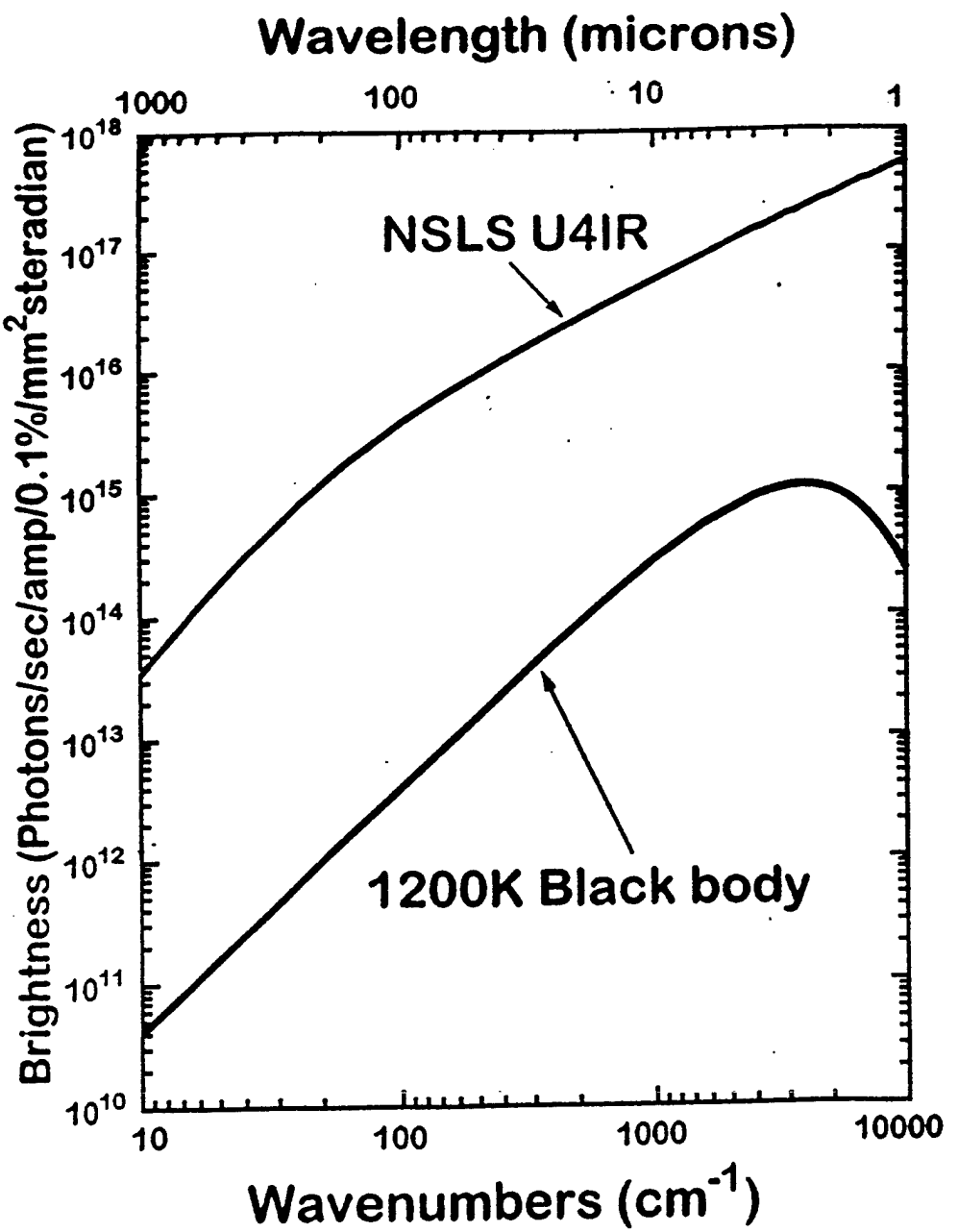
DISCLAIMER



Brightness comparison of the NSLS U4IR and a 1200K standard thermal source.

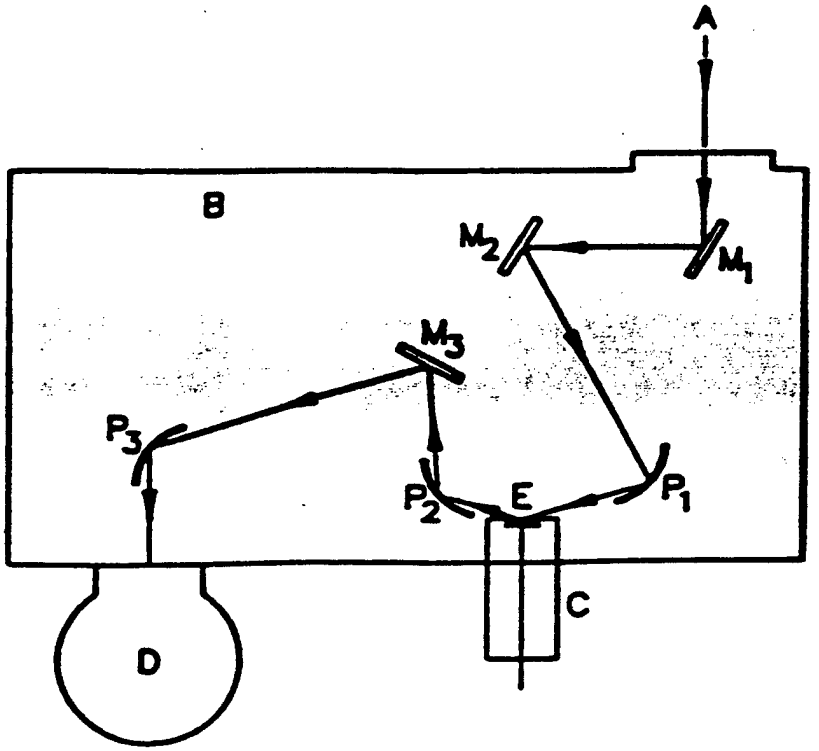
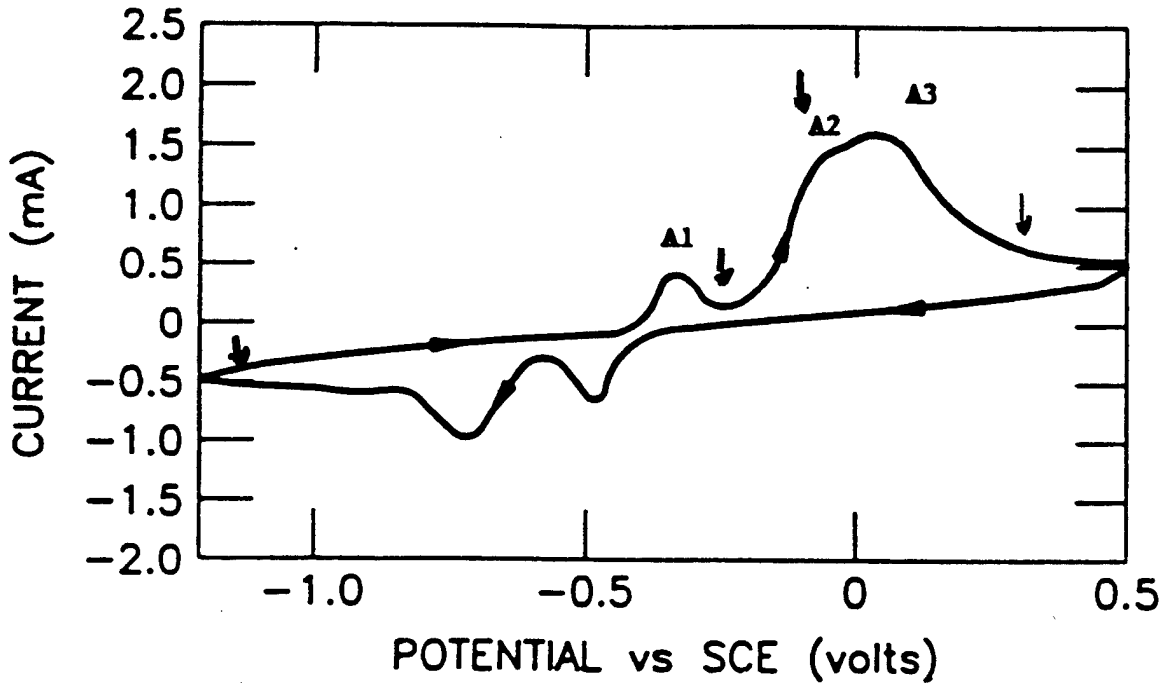
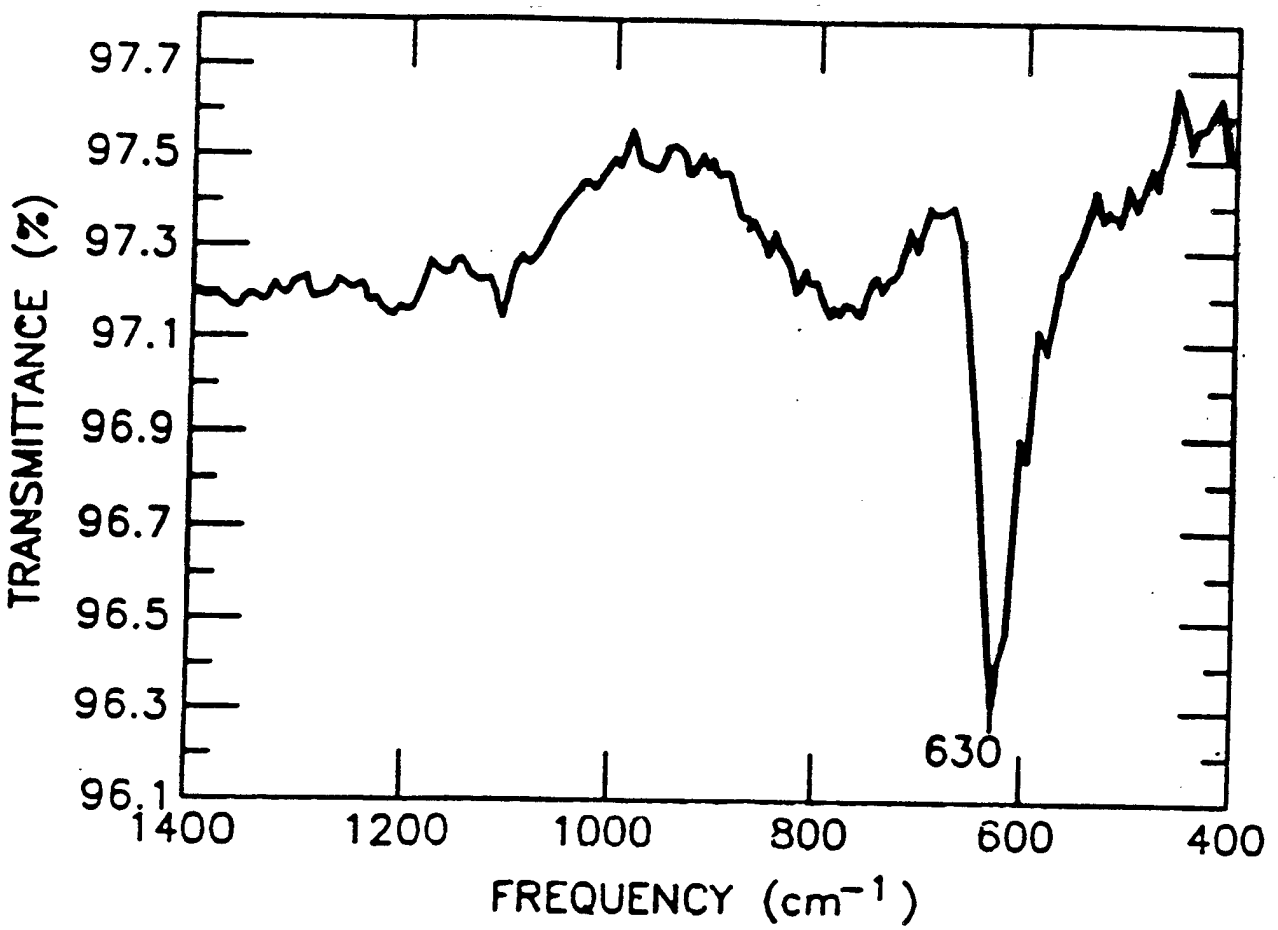


Fig. 1. Schematic of Optical Layout for Synchrotron Far IR Spectroscopy

A - Collimated IR beam from synchrotron (through Nicolet Impact 400)
B - Purgeable chamber
C - Electrochemical cell
D - Detector
E - Platinum electrode
M_1, M_2, M_3, are plain mirrors
P_1, P_2, P_3, are off-axis paraboloid reflectors



Cyclic voltammogram of copper in 0.1 M NaOH solution at scan rate of 20 mV/sec.



"In-Situ" Synchrotron IR spectrum of copper in 0.01 M NaOH solution at –0.05 V vs. SCE.

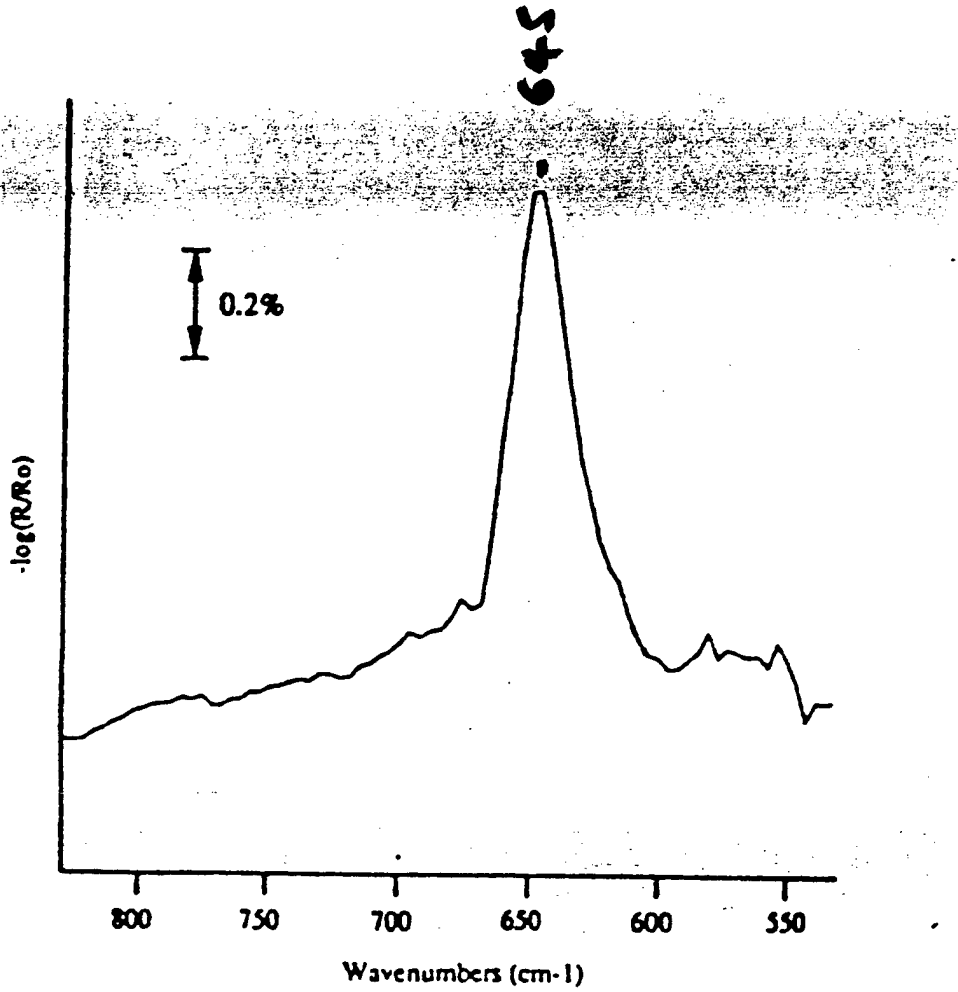


Fig. 4. *In situ* IRAS spectrum in the region from 830 to 530 cm^{-1} for copper exposed to flowing air of 90% humidity.

Persson (JECS '93)

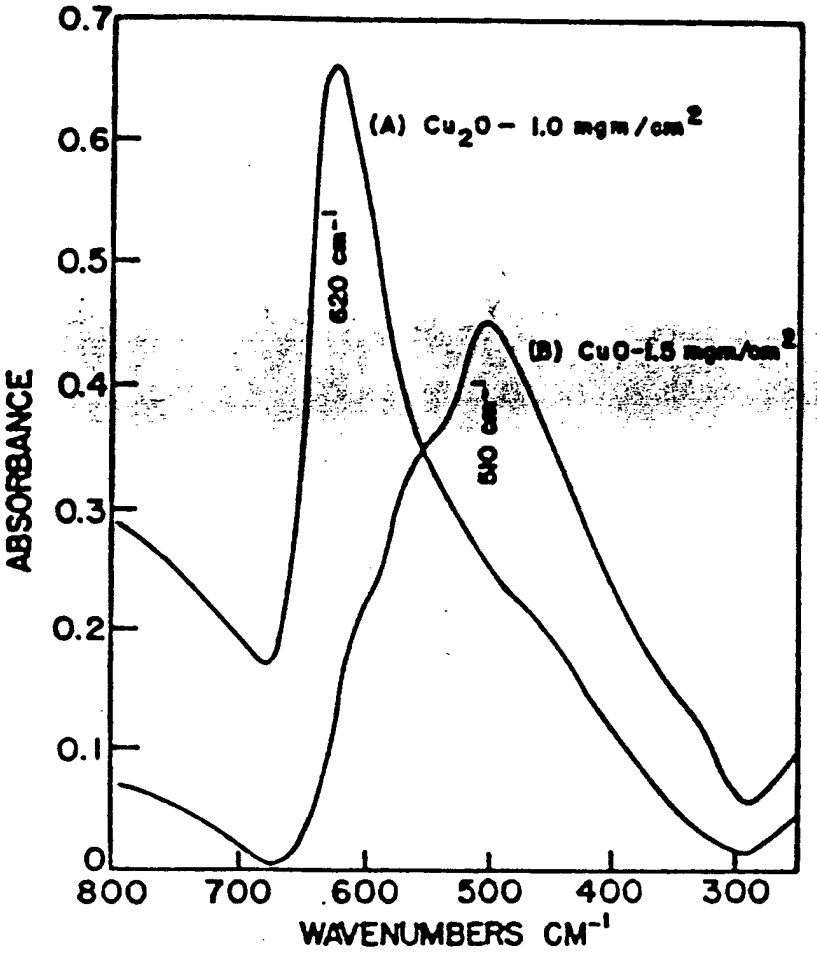


Fig. 1. Transmission spectra of Cu_2O and CuO (in KI pellets)

Poling (JECS '69)

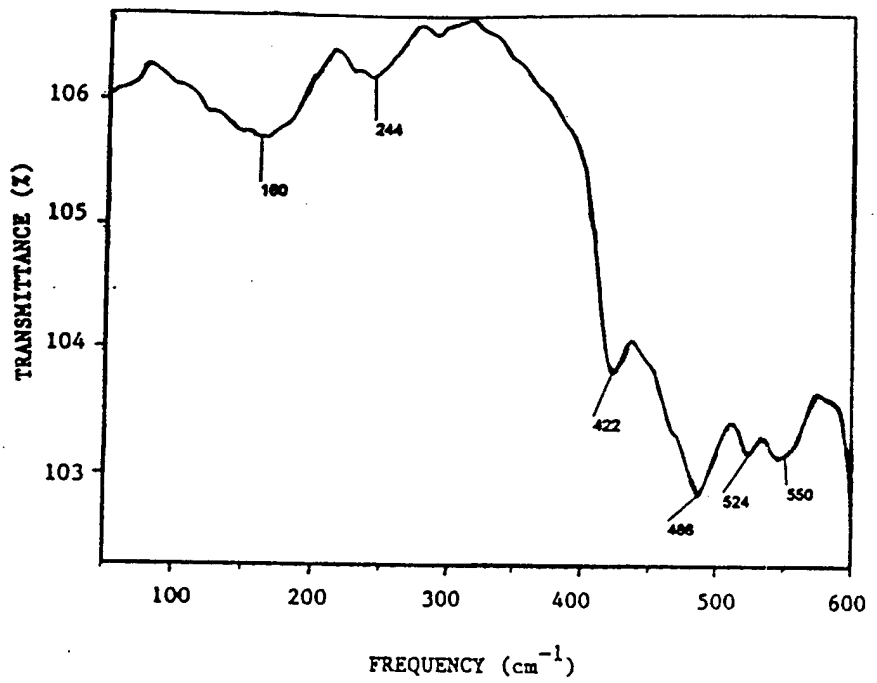


Figure 3. "In-situ" far IR spectrum of Cu in 0.1 M NaOH at 0.3 V vs. SCE (referenced to spectrum at -1.0 V).

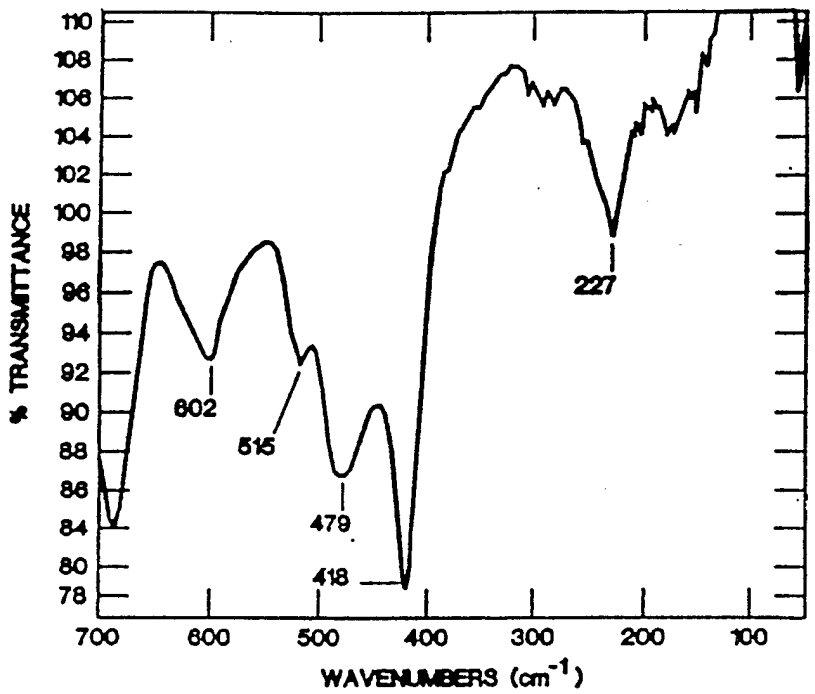


Figure 4. Far IR spectrum of $Cu(OH)_2$ powder in a Nujol mull.

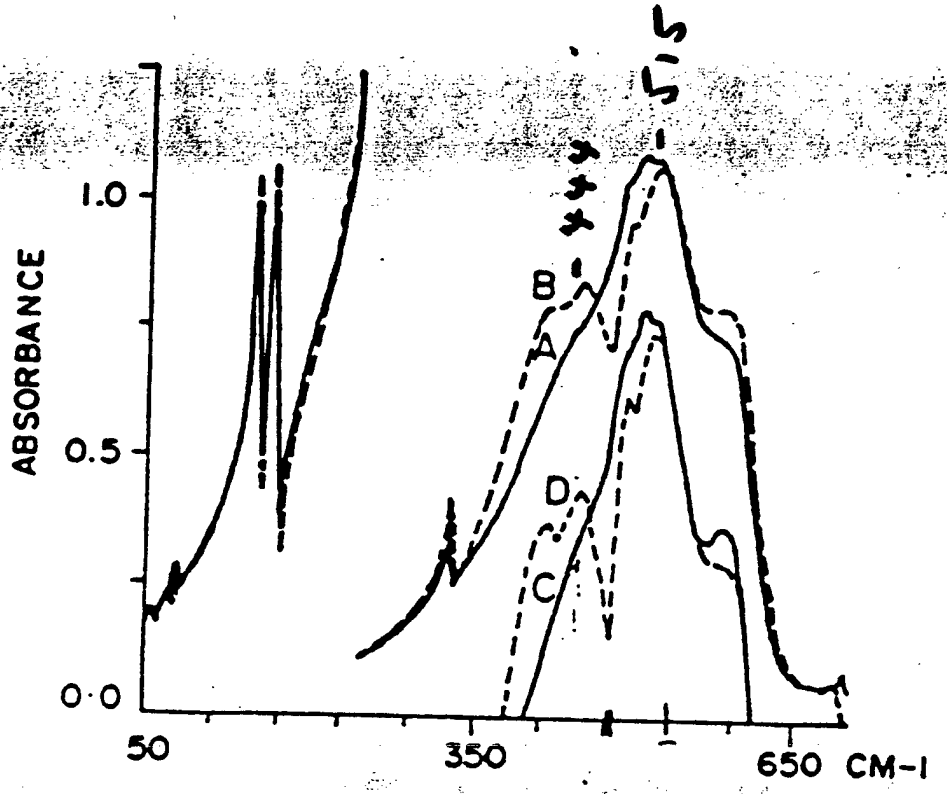


Fig. 1. Absorption spectra of CuO (paraffin mull) at 90 K and 300 K. (A) (solid line) 300 K. (B) (broken line) 90 K. (C) Deconvolution of A. (D) Deconvolution of B.

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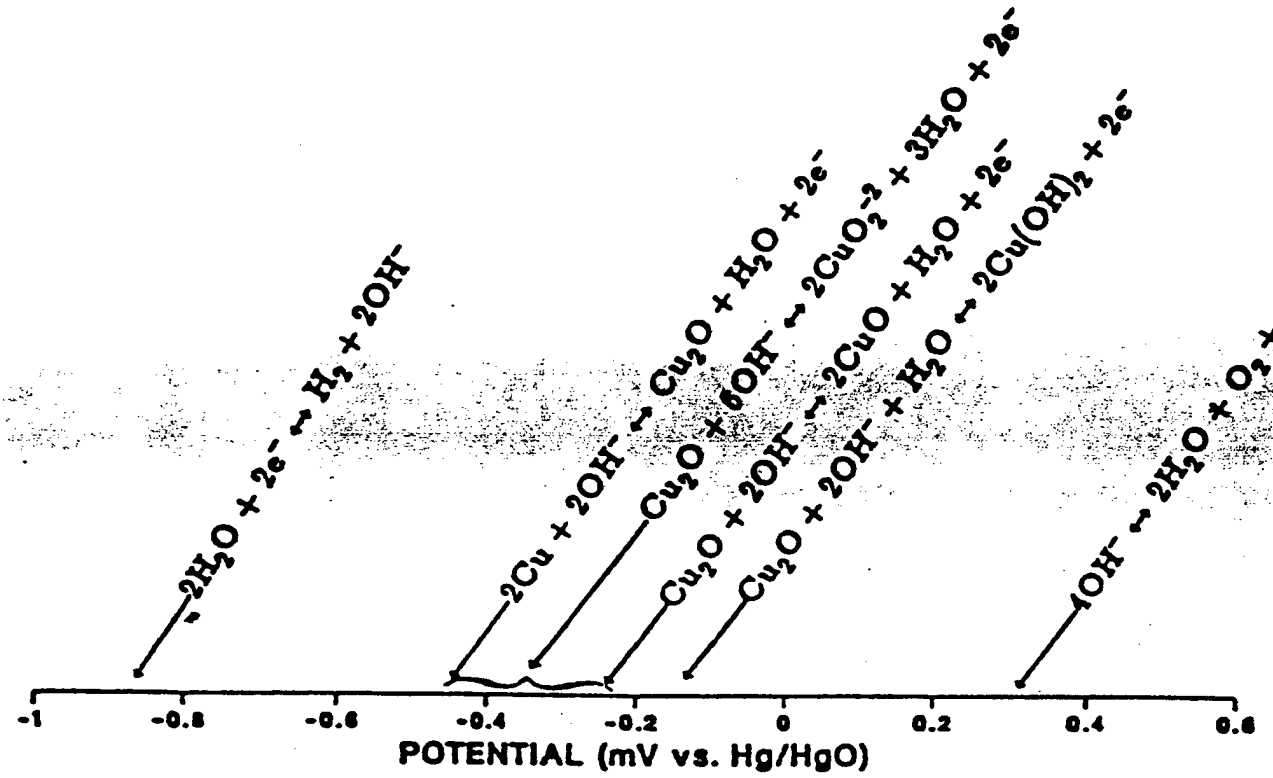

Thermodynamic potentials of various reactions of copper in 1 M KOH vs. Hg/HgO reference electrode.

Mayer (JECS '92)

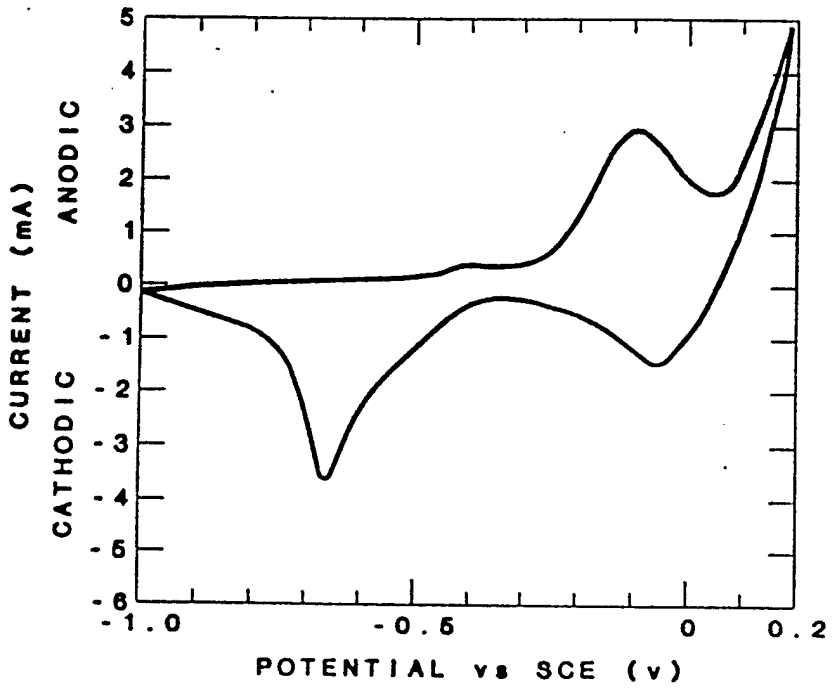

Figure 5. Cyclic voltammogram of Cu in 0.01 M KSCN + 0.1 M $KClO_4$ solution at a scan rate of 100 mV/sec.

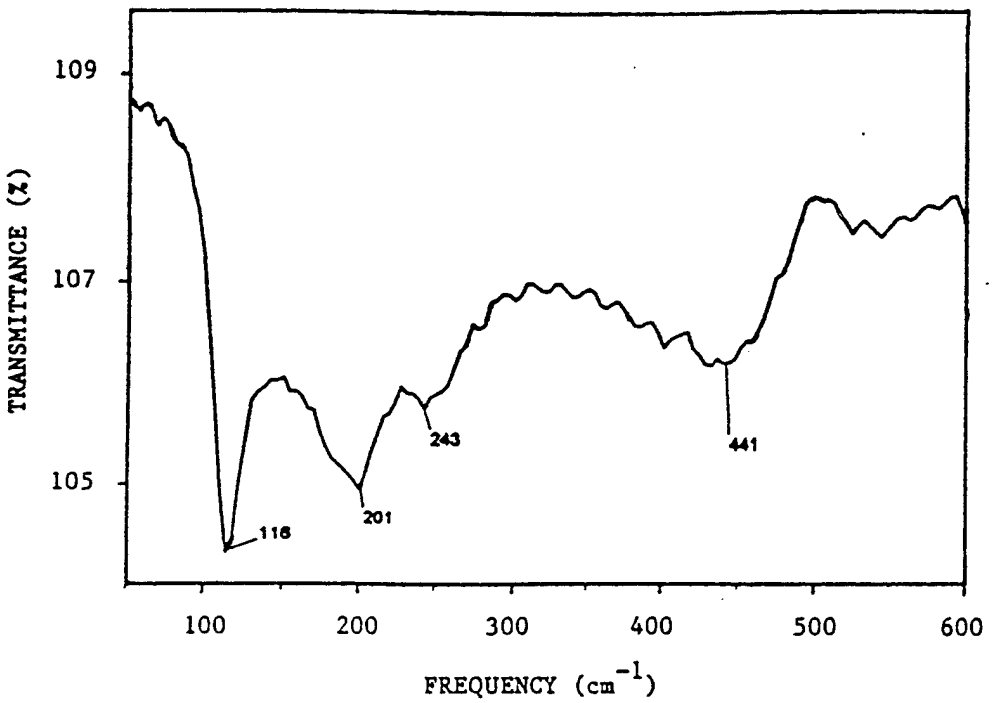

Figure 6. "In-situ" synchrotron far IR spectrum of Cu in 0.025 M KSCN + 0.1 M $KClO_4$ solution at 0.05 V vs. SCE (referenced to spectrum at 1.10 V).

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