N86-29358

PHOTOVOLTAICS MODULE INTERFACE: GENERAL PURPOSE PRIMERS

UNIVERSITY OF CINCINNATI

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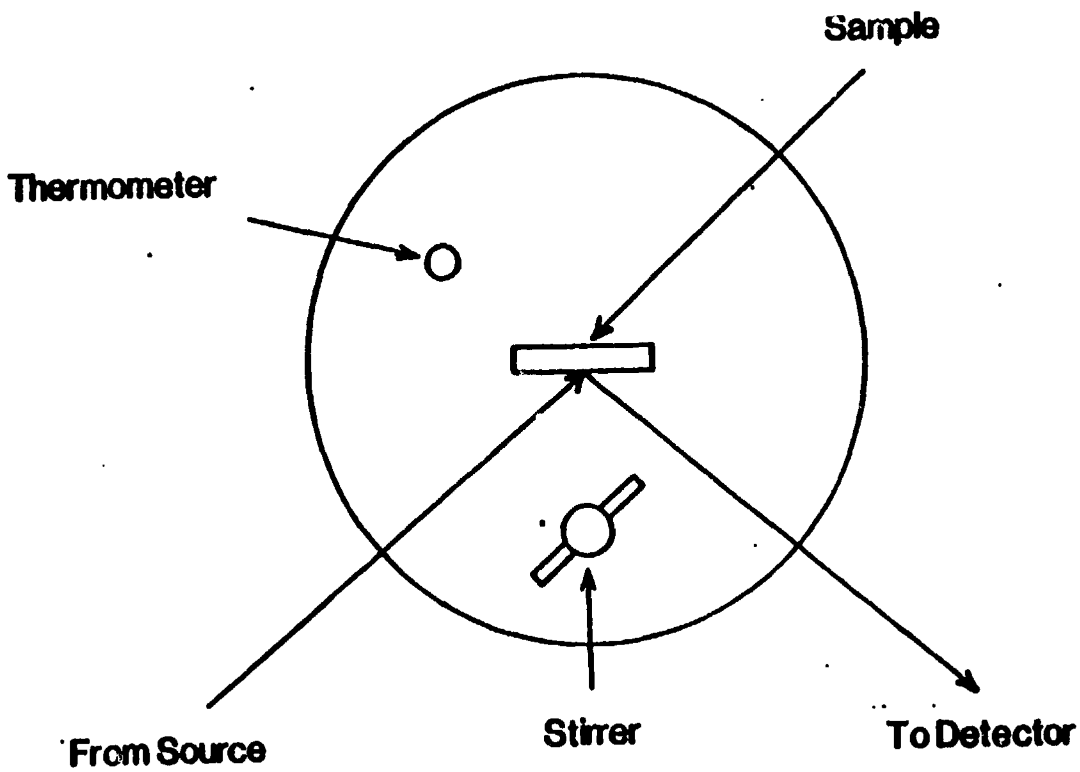

Figure 2. Sample cell for in-situ ellipsometry of metals exposed to water.

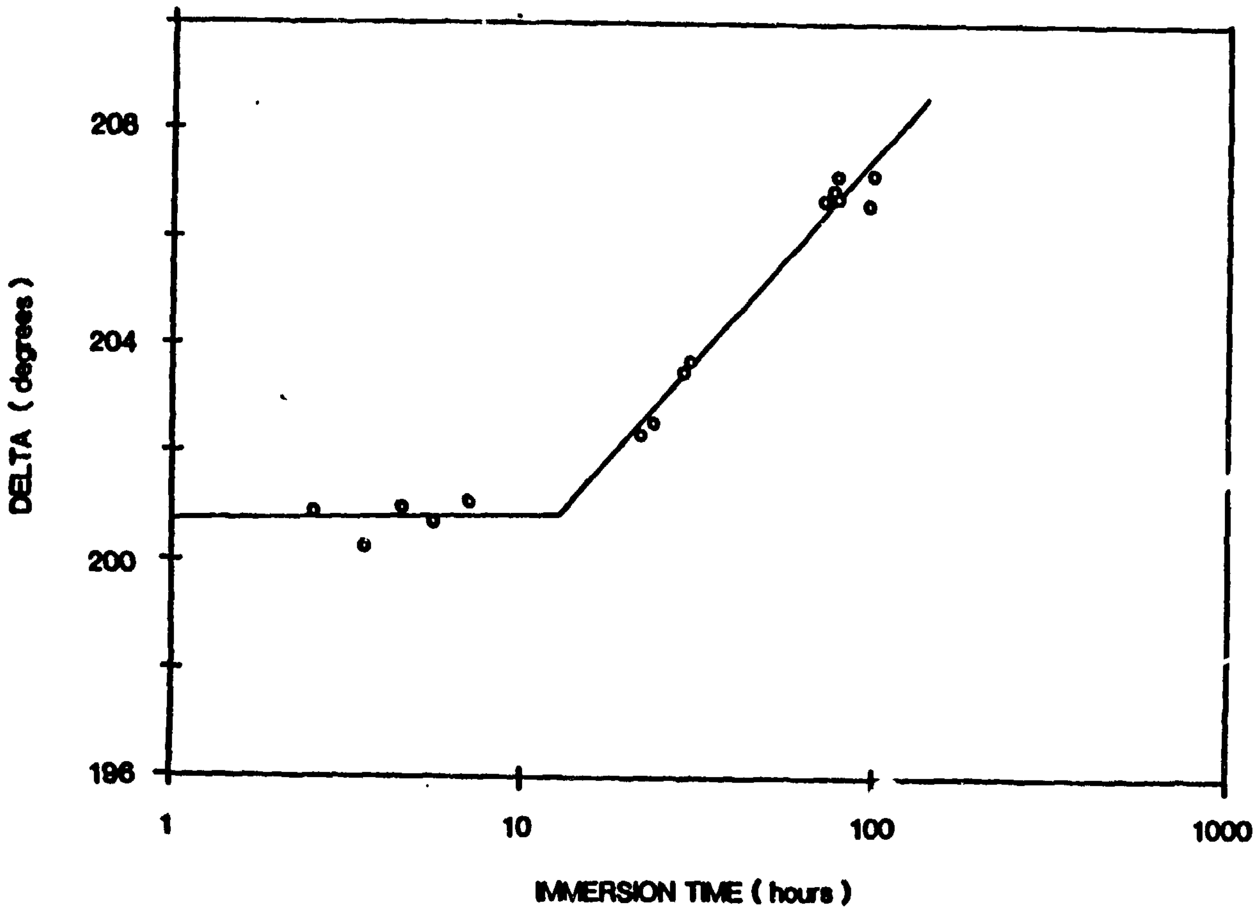

Figure 4. In-situ ellipsometry for EVA/Al in water at 40°C; no primer.

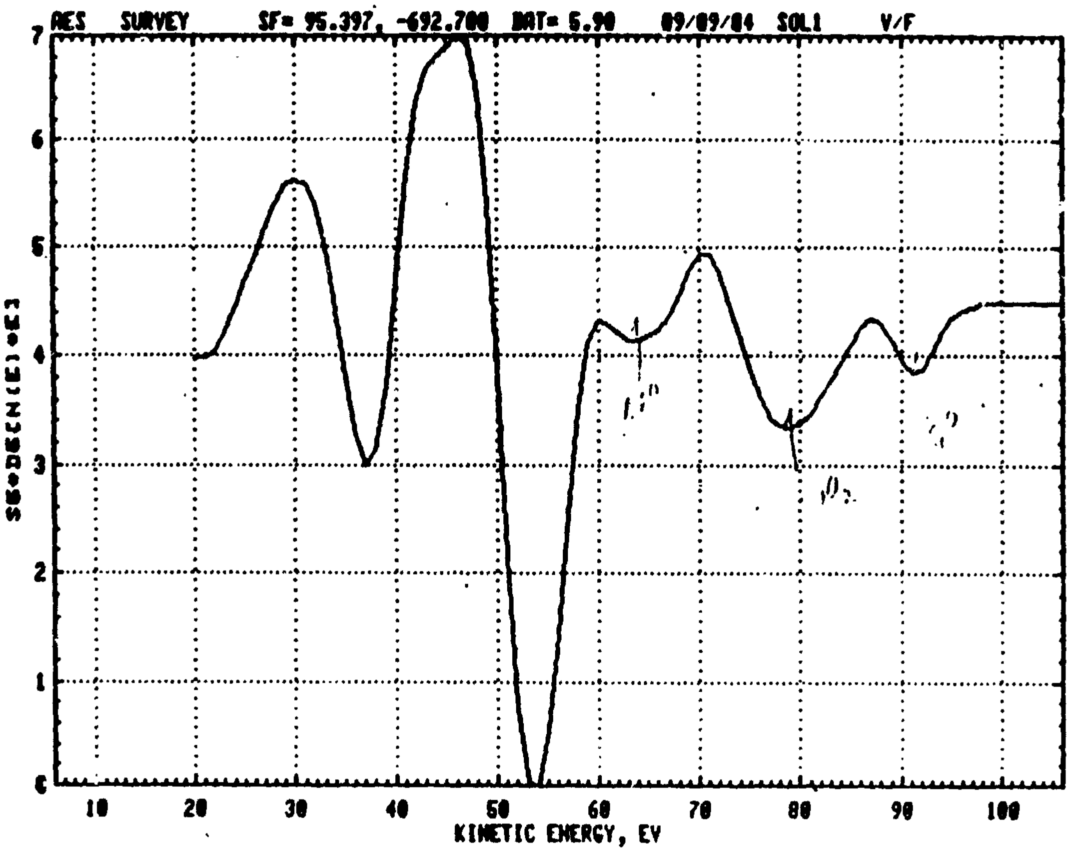

Figure 2. Aluminum and silicon Auger electron spectra from back surface of silicon wafer.

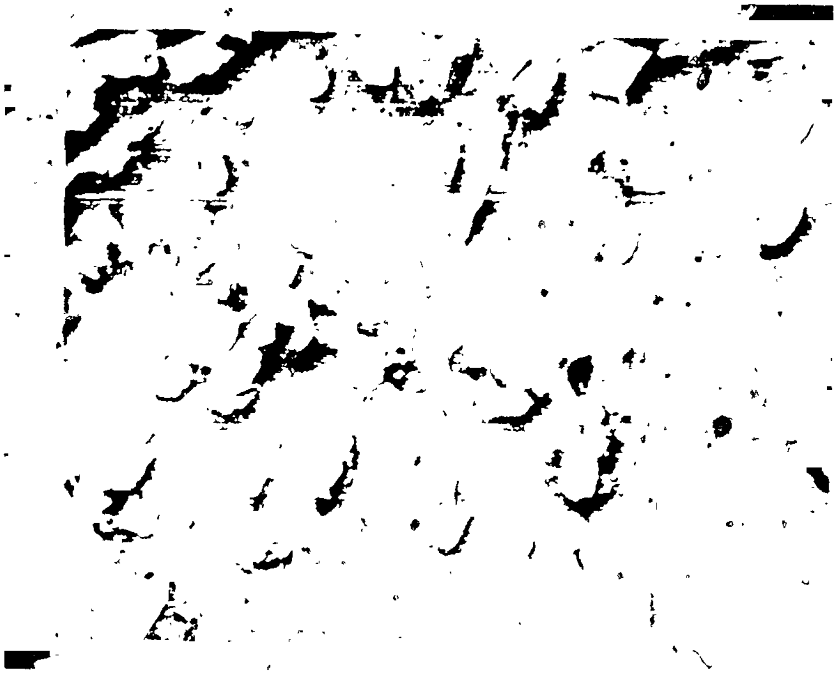

Figure 3. Scanning electron micrograph of "rough" aluminized backside of silicon wafer at 2000X.

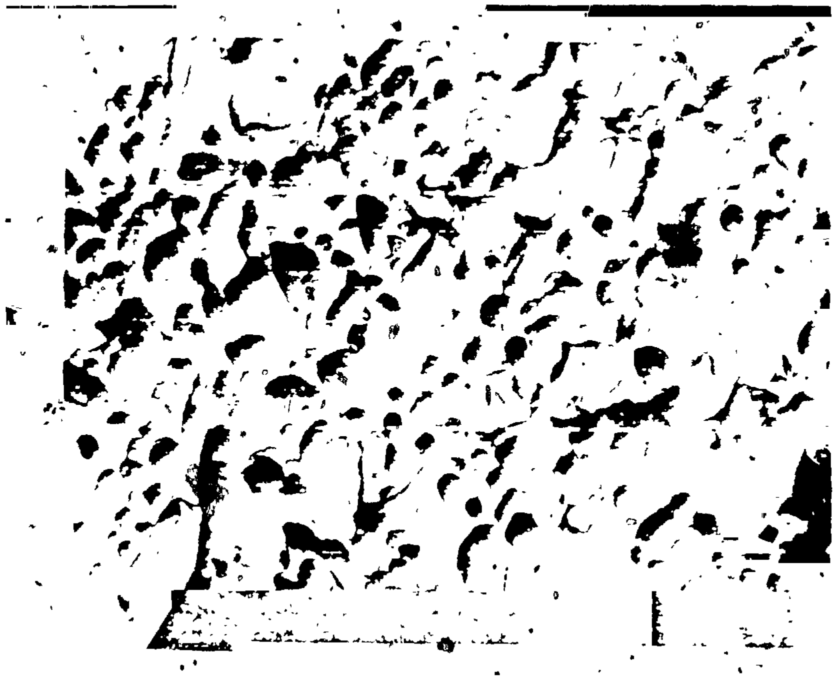

Figure 5. Scanning electron micrograph of "rough" aluminized backside of silicon wafer at 2000X.

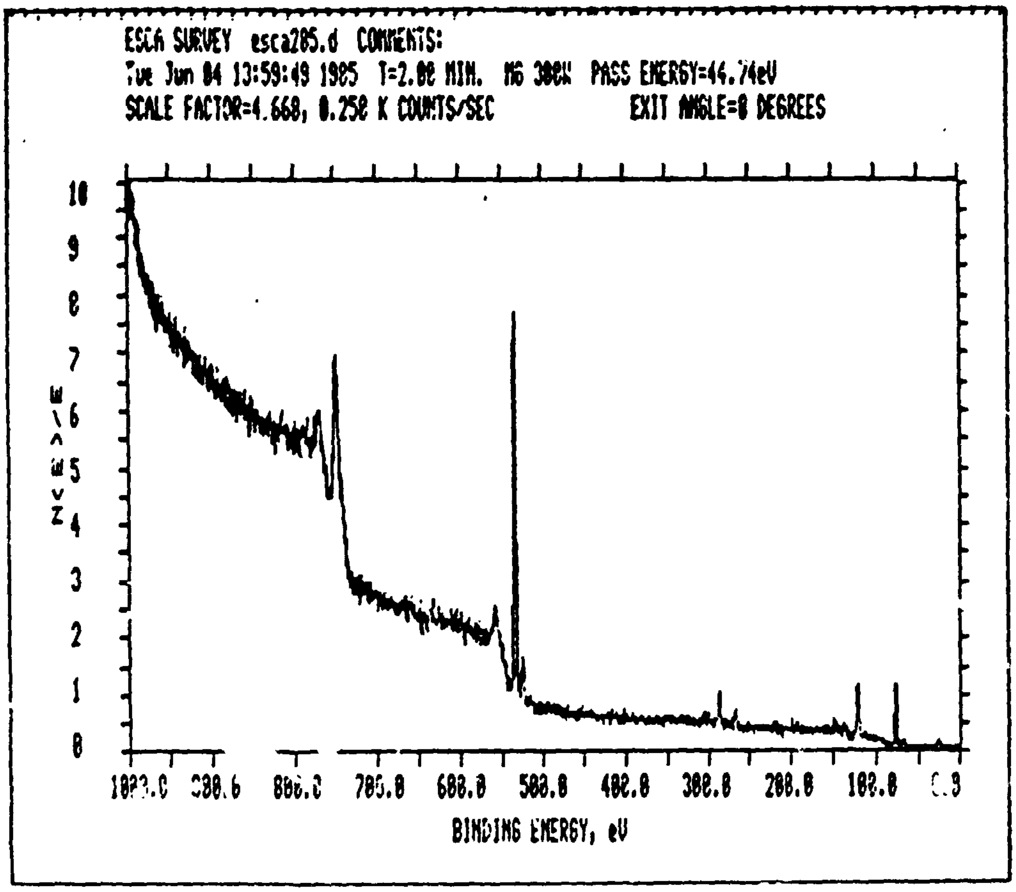

Figure 1. XPS spectrum of "rough" aluminized backside of silicon wafer.

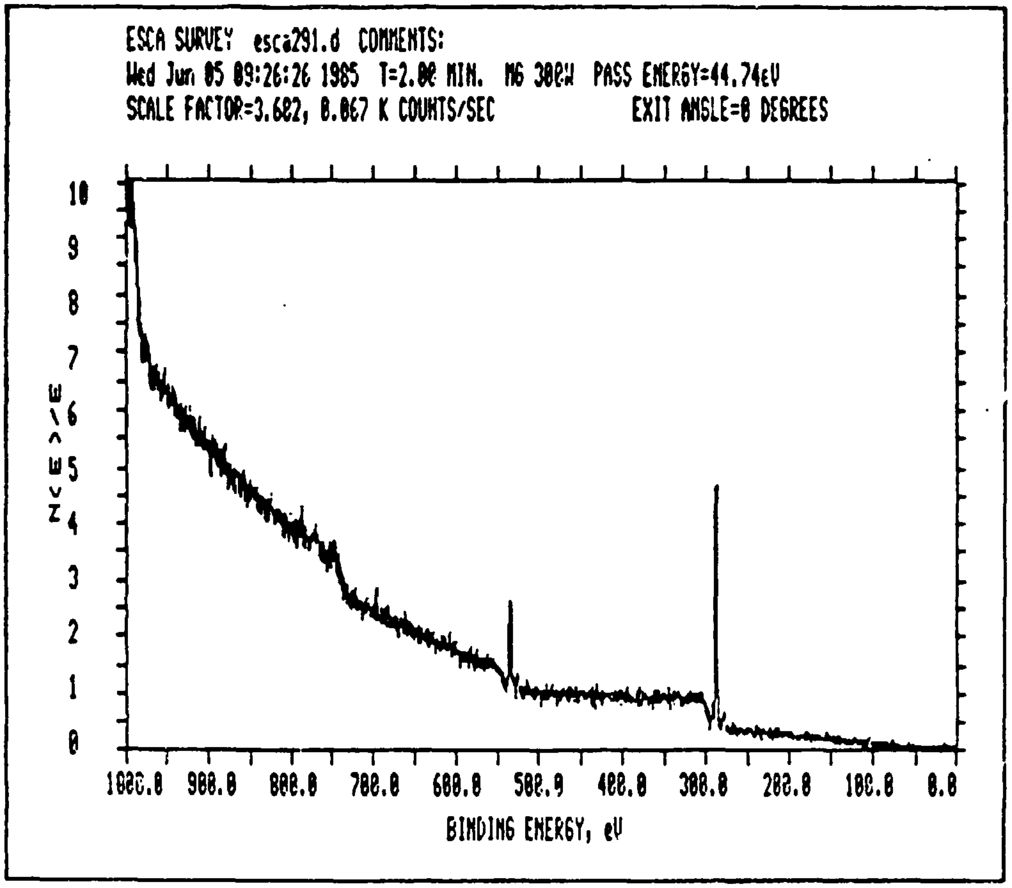

Figure 2. XPS spectrum of laminated silicon wafer after peeling EVA film.

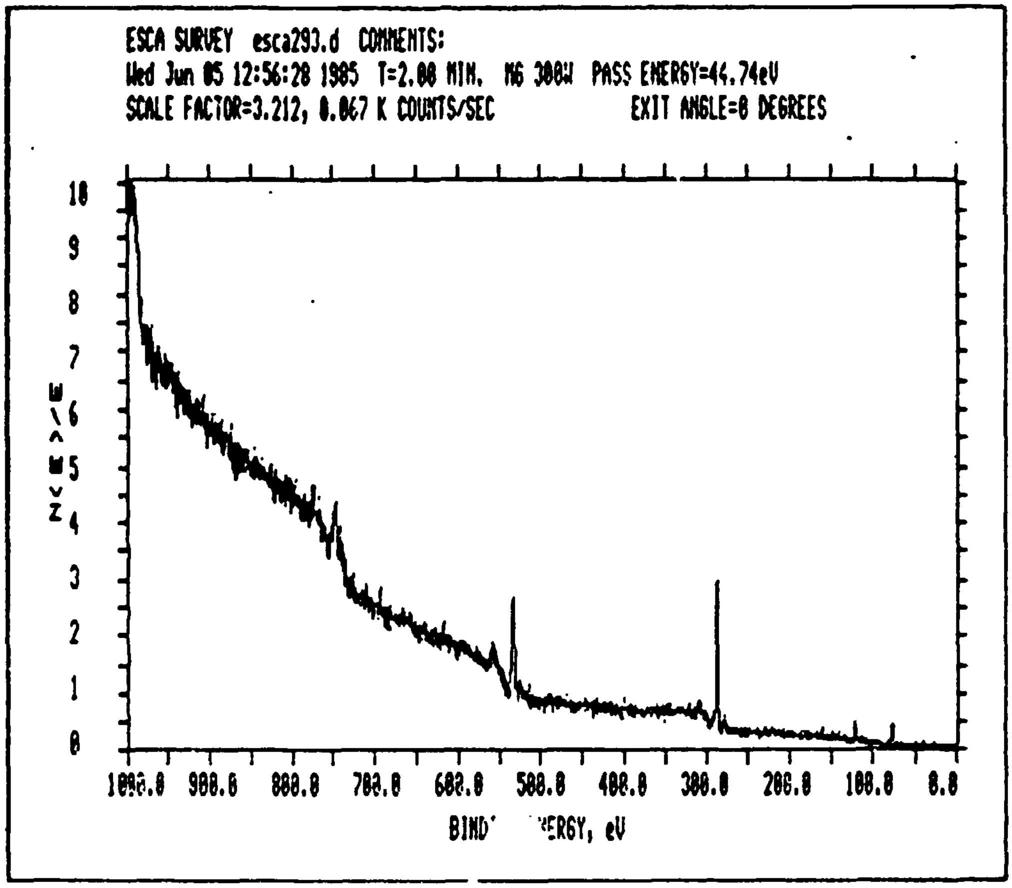

Figure 3. XPS spectrum of laminated silicon wafer after boiling for one hour and peeling EVA film.

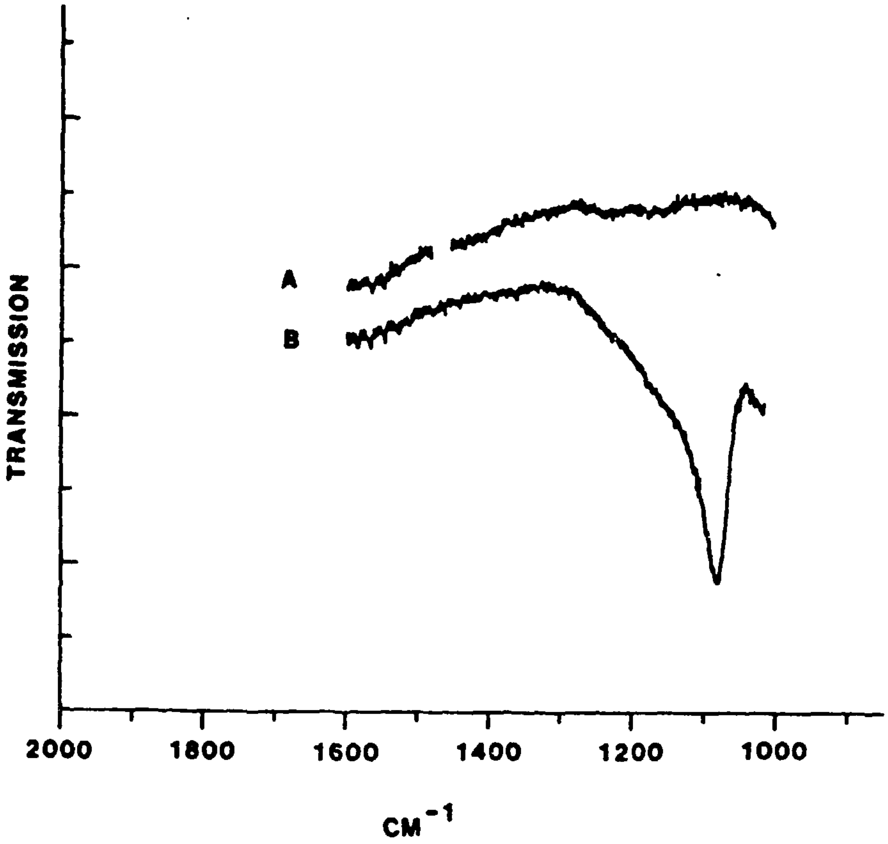

Figure 9. Reflection infrared spectra obtained from "rough" aluminized backsides of silicon wafers (A) - before and (B) - after immersion in boiling water for 30 minutes.

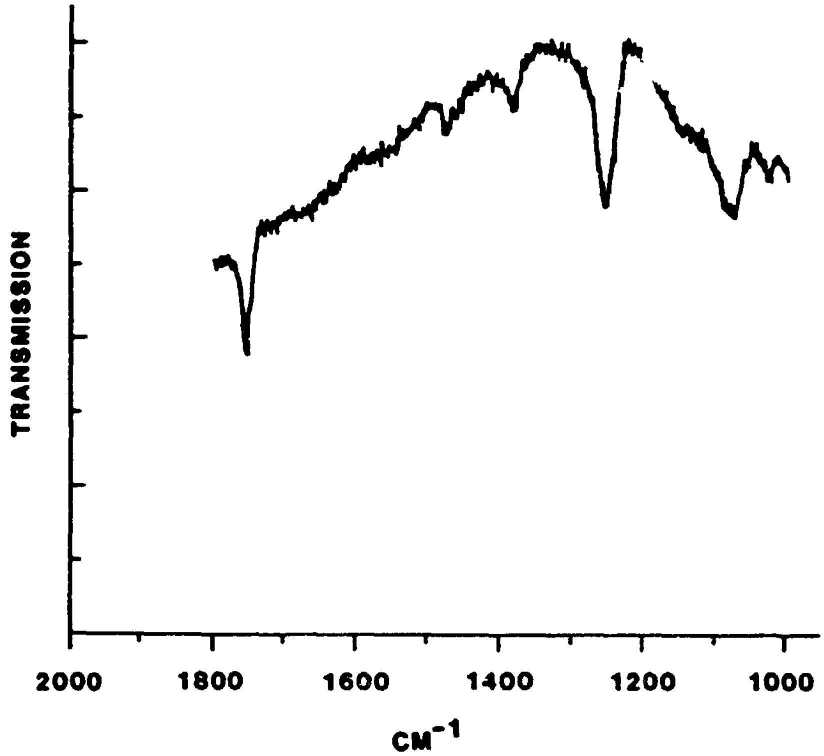

Figure 8. Reflection infrared spectrum obtained from "rough" aluminized backside of silicon wafer that was boiled in water for 30 minutes and then coated with a thin film of L'A.

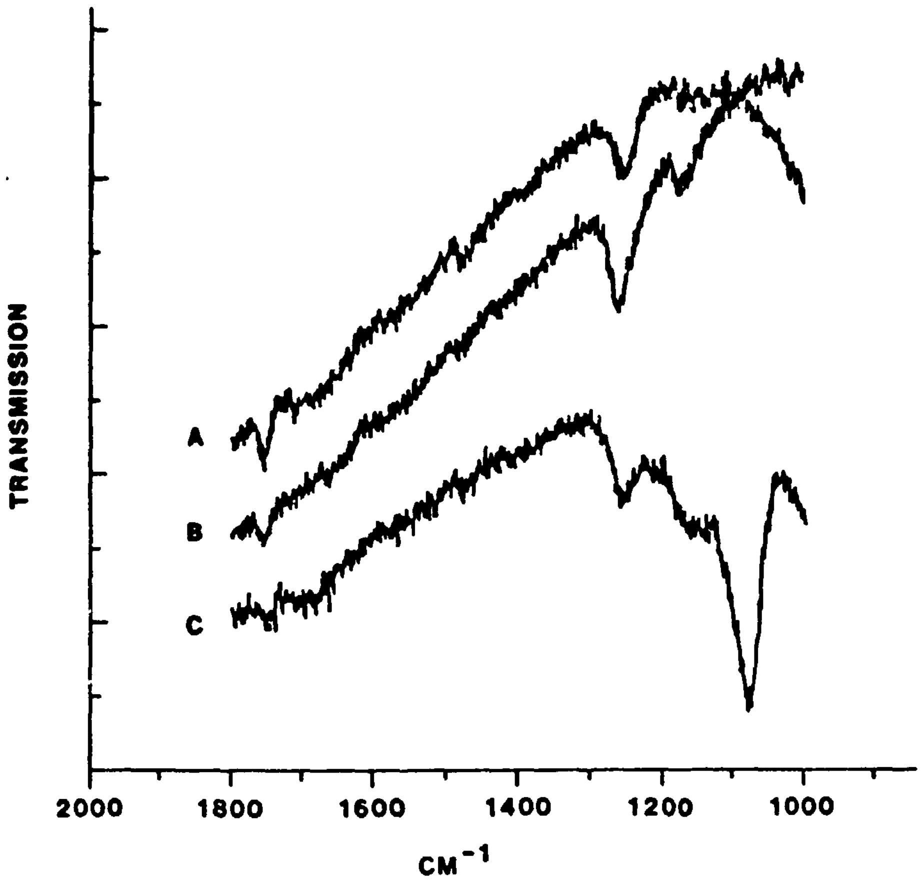

Figure 10. Reflection infrared spectra obtained from "rough" aluminized backsides of silicon wafers coated with thin films of EVA (A) - before immersion in boiling water and after immersion for (B) - 20 minutes (C) - 50 minutes.

Conclusions

1. A hydrated oxide known as pseudoboehmite is formed on the aluminized backside of silicon wafers during exposure to warm, moist environments.

2. Formation of pseudoboehmite leads to the failure of adhesive bonds between EVA and the aluminized backside of silicon wafers.

3. A-11861 is an effective primer for obtaining durable bonds between EVA and "rough" aluminized backsides of silicon wafers.

4. A-11861 may not be adequate for obtaining durable bonds between EVA and "smooth" aluminized backsides of silicon wafers.

5. Infrared spectroscopy is an effective, non-destructive technique for characterizing the interface between EVA and the aluminized backsides of wafers that are "rough" or "smooth."

6. Ellipsometry is an effective, non-destructive technique for characterizing the interface between EVA and the aluminized backsides of wafers that are "smooth."