

**The Effects of Chemical Cleaning on Impregnant Removal as a Function of  
Impregnant Type**

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A liquid cleaning technique, commonly referred to as SRLV or EDTA cleaning, is often used to clean the emitting surface of dispenser cathodes. The process is based on chemical chelating (“to make soluble”) principles. The controlled process removes a shallow layer of impregnant material from the impregnated tungsten matrix. This produces a cathode with more predictable activation behavior and reduces initial evaporation products. Additionally, a thoroughly cleaned surface enhances sputtered coatings adhesion.

This investigation reports on the amount of impregnant removed as a function of impregnant type and as a function of time. Methods used to evaluate the amount of material removed include copper back filling and metallographic sampling. A typical polished, etched cross section is represented in Figure 1. Results are presented in Figure 2. Variability in the data is primarily due to the complexity of the BaO – CaO – Al<sub>2</sub>O<sub>3</sub> oxide system and the impregnation process, Figure 3 (1100c Isotherm)..

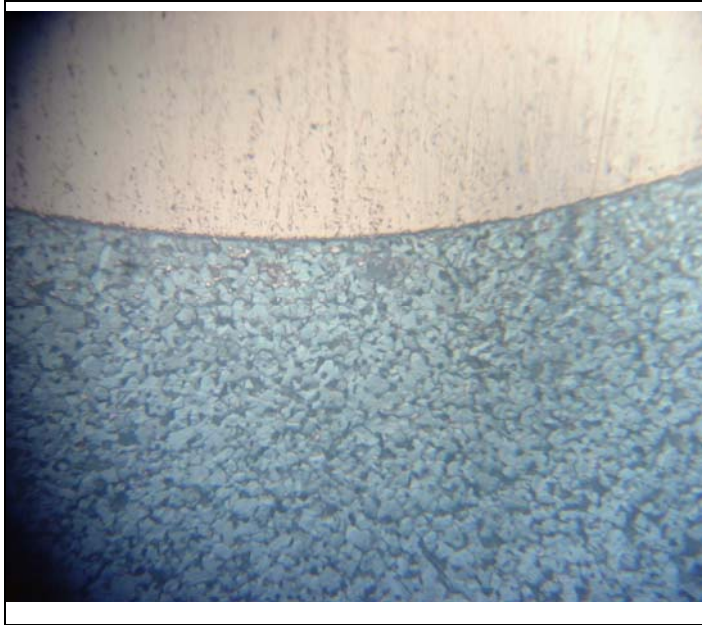


Figure 1. Example of Copper Filled, Polished and Etched Cross Section

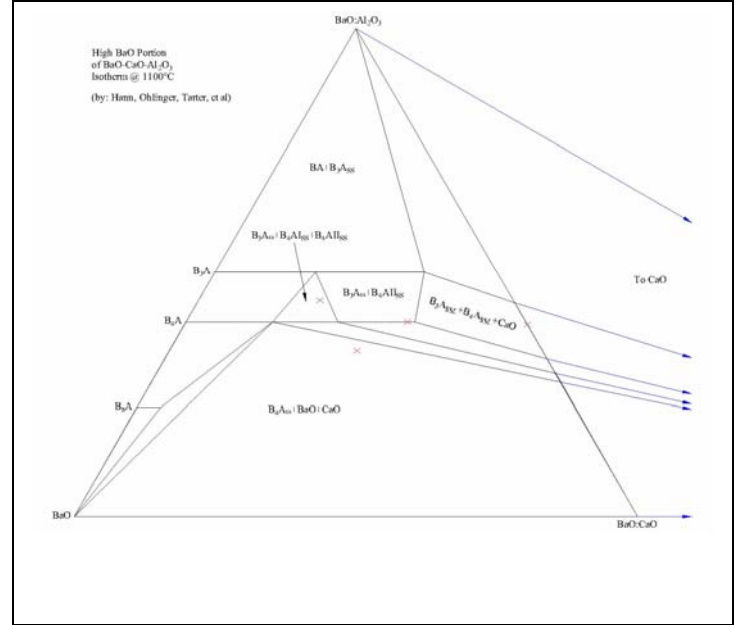


Figure 3. 1100c Isotherm High BaO Portion of BaO-CaO-Al<sub>2</sub>O<sub>3</sub> Phase Diagram

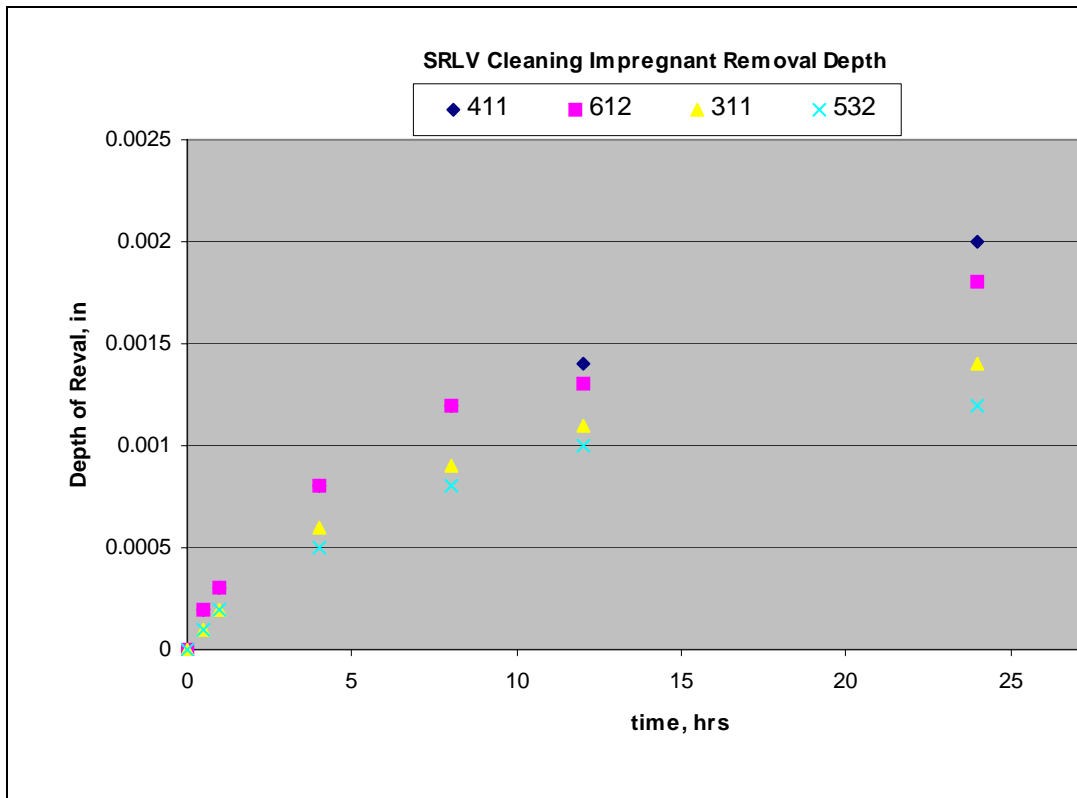


Figure 2. Impregnant Removal Depth f (Impregnant Type)