

Thin Film to Prevent Recoil Contamination of Solid-State Alpha Detectors

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Over the past decade, NIST has used an easily prepared thin film technique to minimize recoil contamination of solid-state alpha detectors. Sill and Olson (*Analytical Chemistry*, 42, 1596 (1970)) published an elegant paper advocating the use of $12 \mu\text{g}/\text{cm}^2$ air and a 6 volt negative bias on the source to control alpha recoil contamination of alpha detectors. As an alternative, NIST has used thin films ($\sim 12 \mu\text{g}/\text{cm}^2$ thickness) and a 10 volt negative bias on the source to control alpha recoil contamination of it alpha detectors. A single drop of 1:1 isoamyl acetate:collodion is dropped on the surface of distilled water and allowed to dry for a few minutes. A vertical loop is then inserted into the water bath, and lifts the film off of the water vertically to form a double thickness of film. The film is then transferred to a metal ring that has a diameter larger than a counting source, and air dried. When used, the film is placed about 1 mm above the counting source. Although we have not determined the mechanism for trapping the recoil products, we have successfully used these disposable thin films for many years and have not suffered any noticeably detectable loss of spectral resolution.