

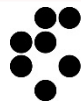


Introduction to preparation of counting sources

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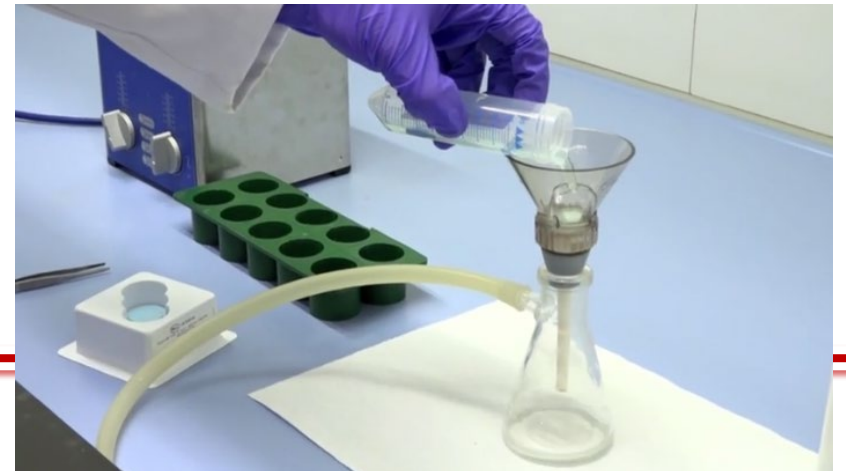
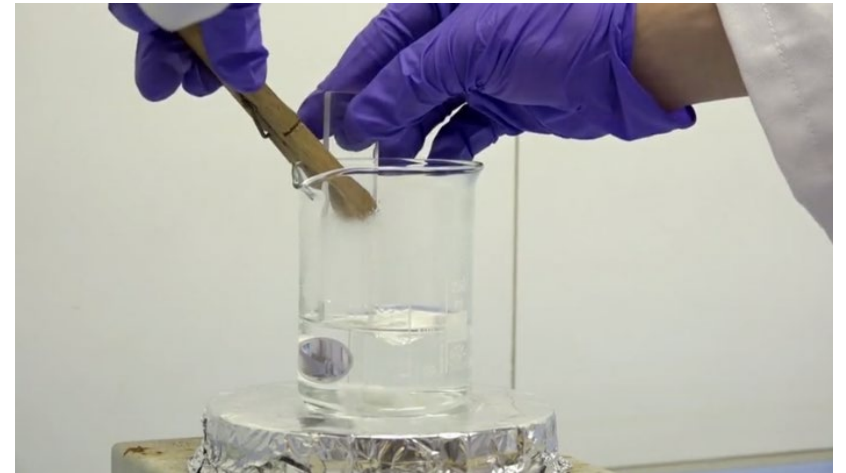


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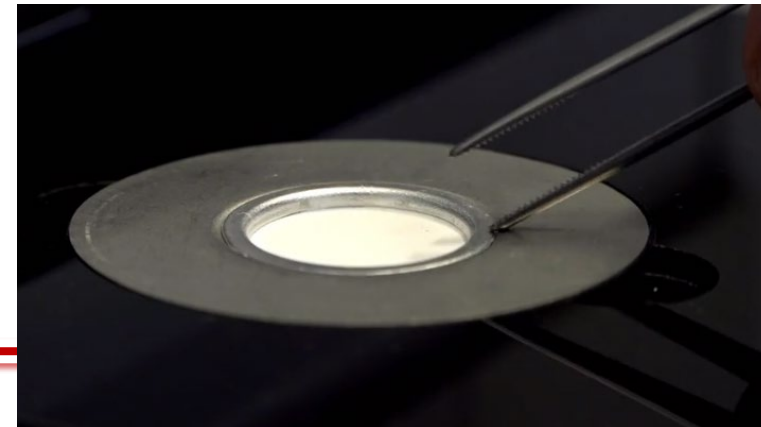
Preparation of counting source for alpha spectrometry

- Need to prevent self-absorption in the sample
- Very thin layer on inert support disc
- Electroplating
- Spontaneous deposition (polonium)
- Micro-co-precipitation
with Nd or Ce for U, Th, Am
with Ba for Ra



Preparation of counting source for proportional counter

- Sample prepared as precipitate
- Precipitate is evenly deposited on the counting planchet
- Carrier often acts also as tracer where recovery is determined gravimetrically
- Examples:
 - PbSO_4 for Pb-210
 - SrCO_3 for Sr-90



Preparation of counting source for liquid scintillation counter

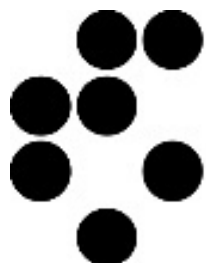
- Sample is in liquid form and transparent
- Scintillation cocktail (solvent, primary scintillator, secondary scintillator and surfactants for aqueous samples)
- Sample and scintillation cocktail should be completely miscible
- Mix them in scintillation vial made from plastic or low background glass
- Highly acidic or alkaline samples are not suitable to be mixed with scintillation cocktail
- Examples: H-3, C-14, Sr-90, Pb-210



Preparation of counting source for gamma spectrometry

- Sample should be packed in container with defined geometry
- Geometry and density should be similar to calibration standards
- Ra-226 is often measured via Rn-222 decay products => need to seal the container to prevent Rn-222 escape
- If Ra-226 is measured via Rn-222, sufficient time should pass (approx 30 days) to achieve secular radioactive equilibrium
- Water samples are usually pre-concentrated by evaporation and dry residue is measured
- Biological materials are often ashed to reduce sample volume

meet cinch



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