LSC in Practice

Low Count Rate With ULTIMA Gold MV

Problem

A researcher was preparing samples and performing standard LSA counting using plastic vials and PerkinElmer's ULTIMA™ Gold MV (part number 6013159), a member of the ULTIMA Gold family of modern, safer cocktails. Unfortunately, the researcher was observing lower than expected ^{3}H count rates and suspected that he may have exceeded the practical sample loading for this cocktail.

The researcher's sample preparation consisted of 2.0 mL of acetonitrile and 1.0 mL water added to 7.0 mL of ULTIMA Gold MV.

After observing low counts, the researcher varied the preparation techniques and recorded the following data:

Table 1.

Acetonitrile (mL)	Water (mL)	ULTIMA Gold MV (mL)	Activity Detected
2	0	7	15,000 CPM
2	1	7	5,000 CPM

Discussion

ULTIMA Gold MV was specifically formulated for the rapid uptake of aqueous and non-aqueous samples. Due to its low viscosity and high counting efficiency the cocktail is ideal for counting small volume samples in miniature vials (hence the name ULTIMA Gold MV, signifying Micro Volume).

ULTIMA Gold MV can accept 1.0 mL of water in 7.0 mL of cocktail. In addition, it can accept 2.0 mL of acetonitrile in 7.0 mL of cocktail. However, when you try to add both 1.0 mL of water plus 2.0 mL of acetonitrile in 7.0 mL of cocktail an unstable mixture is formed which rapidly separates into two layers.

From the observed results obtained in Table 1, it can be concluded that the activity present is aqueous soluble and when this mixture is prepared, the activity ends up in the highly quenched lower aqueous phase.

Recommendations

1. Increase the volume of ULTIMA Gold MV to 15.0 mL and keep the samples at their present levels. This will yield a stable, reproducible mixture.
2. Refine new sample preparation techniques using glass vials to ensure any cloudiness or separations can be easily observed. Plastic vials can be used when the method is refined.

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