LSC in Practice

Safer Cocktail Selection for a Methanol/Tris-HCl Buffer

Introduction

Cost and safety had become a major concern in one laboratory. The lead researcher contacted our local PerkinElmer representative and requested assistance to find "the most economical safer scintillation cocktail" for his samples.

The samples were composed of ^{3}H-adenosine with ten parts by volume methanol added to five parts by volume 40 mM Tris-HCl (pH 8.0) buffer containing 4 mM beta-mercaptoethanol. The total volume of the prepared samples was 12 mL which was to be counted in 20 mL polyethylene vials.

Discussion:

We observed that this system is not as simple as it may first appear. As we had seen in the past, the presence of methanol would cause problems.

Although the request was for "the most economical safer scintillation cocktail," we suspected it might actually be a case of "what cocktail will work?"

For this evaluation we prepared the sample as follows:

Two parts methanol added to one part 40 mM Tris-HCl (pH 8.0) containing 4 mM beta-mercaptoethanol

Knowing there would be problems, we also prepared two additional samples of the above, using ethanol and isopropyl alcohol (IPA) as alternatives to methanol.

2 mL of the sample was then added to 10.0 mL of various cocktails at 20 °C with ULTIMA Gold™, Opti-Fluor™ and Poly-Fluor™ (PerkinElmer part numbers 6013329, 6013199 and 6013279, respectively) with the following results:

	ULTIMA Gold	Opti-Fluor	Poly-Fluor
Methanol/Tris-HCl	White emulsion	White emulsion	White emulsion
Extra 5 mL cocktail	Clear	White emulsion	White emulsion
Ethanol/Tris-HCl	Clear	White emulsion	White emulsion
IPA/Tris-HCl	Clear	White emulsion	Clear

In addition, we also tested the standard methanol/Tris-HCl sample with both ULTIMA-Flo™ M (PerkinElmer part number 6013579) and ULTIMA-Flo AP (PerkinElmer part number 6013599), and, since they were designed to work with alcohol/water mixtures, both cocktails easily accepted this sample.

Recommendation

From these data, the researcher had several options to select from:

1. Use either ULTIMA-Flo M or ULTIMA-Flo AP without alteration of the sample composition.
2. Use ULTIMA Gold but increase the cocktail volume to 15 mL for his original sample.
3. Use Poly-Fluor but change from methanol to IPA.
4 Use ULTIMA Gold at 10 mL volume but change from methanol to either ethanol or IPA.

PerkinElmer®
precisely.

PerkinElmer, Inc.
940 Winter Street
Waltham, MA 02451 USA
Phone: (800) 762-4000 or
(+1) 203-925-4602
www.perkinelmer.com

For a complete listing of our global offices, visit www.perkinelmer.com/lasoffices

007902_39