

**GENERAL PROCEDURES FOR EVALUATION OF A CLEANER****Application**

This procedure covers preparation of cleaners for analysis and a general qualitative evaluation of a cleaner.

**Apparatus Required****Burner**

Bunsen, Fisher, Meker or equivalent.

**Erlenmeyer Flask****Pipet**

10 mL

**Volumetric Flask**

1000 mL; calibrated

**Platinum Wire****Beaker**

150 mL

**Watch Glass**

Used to cover 250 mL beaker

**Cobalt Glass**

The above apparatus is available from any reputable laboratory equipment supply house.

**Materials Required****Nitric Acid**

Concentrated, Reagent grade; CAUTION: Corrosive\*

**Hydrochloric Acid**

Concentrated, Reagent grade; CAUTION: Corrosive\*

| Date       | Action  | Revisions                                  |
|------------|---------|--------------------------------------------|
| 2001 01 22 | Revised | Editorial – no technical change A. Cockman |
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**Sulfuric Acid**

Concentrated, Reagent grade; CAUTION: Corrosive\*

**Sodium Hydroxide**

Reagent grade; CAUTION: Corrosive\*

**Ammonium Hydroxide**

Concentrated, Reagent grade; CAUTION: Corrosive\*

**Barium Chloride**

Reagent grade; CAUTION: Poisonous\*

**Lead Acetate**

Reagent grade; CAUTION: Toxic\*

**Methyl Alcohol**

Reagent grade; CAUTION: Low flash point\*

**Diphenylamine**

Reagent grade; CAUTION: Flammable\*

**Molybdic Acid**

85 % concentration, Reagent grade

**Distilled Water**

CO<sub>2</sub> -free; 20 micromhos/cm at 25 °C max conductivity (ASTM D 1125)

**Turmeric Paper**

**Red Litmus Paper**

\* Refer to Industrial Hygiene for health and safety comments regarding the above materials.

**Solutions Required\***

**Ammonium Carbonate or Ammonium Chloride Solution**

Ammonium carbonate (approx. 22 % solution): Dissolve 250 g of the powdered salt in 1.00 L of distilled water containing 100 mL of concentrated NH<sub>4</sub>OH.

Ammonium chloride (10 % solution): Dissolve 100 g of NH<sub>4</sub>CL in 1.00 L of distilled water.

**Barium Hydroxide Solution**

5 % solution, dissolve 50 g of Ba(OH)<sub>2</sub> 8H<sub>2</sub>O in 1.00 L of distilled water.

**Ammonium Molybdate Solution**

Refer to FLTM AZ 102-01

**Ferrous Sulfate Solution**

Refer to FLTM AZ 102-01

**Sodium Hydroxide Solution**

1.0 Normal

**Silver Nitrate Solution**

0.1 Normal

**Albumin Solution**

1 % solution; dissolve 1 g of albumin in 100 mL of distilled water.

**Barium Chloride Solution**

Dissolve 100 g of barium chloride in distilled water and dilute to 1.00 L.

\* Refer to Industrial Hygiene for health and safety comments.

**Conditioning and Test Conditions**

All test values indicated herein are based on material conditioned in a controlled atmosphere of 23 +/- 2 °C and 50 +/- 5 % relative humidity for not less than 24 h prior to testing and tested under the same conditions unless otherwise specified.

**Procedure**

**1. Preparation of Samples for Analysis**

**A. Solids**

The selection of a representative sample is a necessary prerequisite for any accurate analysis. This is particularly important with the alkalis since they are susceptible to rapid contamination by moisture and carbon dioxide upon exposure to air. They are also usually not uniform in particle size and tend to segregate on handling.

Samples in flake or powdered form must be thoroughly mixed and quartered. All operations must be carried out rapidly with a minimum exposure to air.

In the case of heterogeneous materials containing large particles, it is advisable to screen a large sample, grind the coarse fraction, and recombine the two fractions, followed by thorough mixing and quartering.

Place approximately 50 g of the prepared sample into a weighing bottle, weigh the bottle and contents. Remove about 35 to 40 g to a 400 mL beaker. Dissolve rapidly in distilled water and rinse quantitatively into a calibrated 1000 mL volumetric flask. Close the flask at once, cool, make up to the mark at 23 +/- 2 °C with distilled water, and mix thoroughly. Reweigh the weighing bottle and remaining contents and take the weight of sample by difference.