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## Introduction

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### 1. SCOPE

Reagents required in the tests and assay for *U.S. Pharmacopeia* and *National Formulary* articles and those required only in determining the quality of other reagents are listed in this section, with specifications appropriate to their intended uses.

As stated in [General Notices, 6.70 Reagents](#), listing of reagents, indicators, and solutions in the *U.S. Pharmacopeia* in no way implies that they have therapeutic utility; thus, any reference to *USP* or *NF* in their labeling shall include also the term “reagent” or “reagent grade”.

Where a particular brand or source of a material, instrument, or piece of equipment, or the name and address of a manufacturer or distributor, is mentioned (ordinarily in a note or footnote), this identification is furnished solely for informational purposes as a matter of convenience, without implication of approval, endorsement, or certification.

#### 1.1 ACS (AMERICAN CHEMICAL SOCIETY) REAGENT GRADE

Where it is directed to “Use ACS reagent grade”, it is intended that a grade meeting the corresponding specifications of the current edition of *Reagent Chemicals*, published by the American Chemical Society (ACS), shall be used.

#### 1.2 SUITABLE GRADE

In the cases where no ACS reagent monograph exists or if the reagent is available in different quality grades, each one specific for a particular application, it is directed to “Use a suitable grade”. The intent is that a suitable reagent grade available commercially shall be used.

Occasionally, additional test(s) augment the designation “suitable grade”, as indicated in the text. Listed also are some, but not all, reagents that are required only in determining the quality of other reagents. For those reagents that are not listed, satisfactory specifications are available in standard reference publications.

#### 1.3 USP OR NF OR FCC GRADE

In the instances in which a reagent required in a *U.S. Pharmacopeia* or *National Formulary* test or assay meets the requirements in the monograph for that article appearing in this *U.S. Pharmacopeia* or the *National Formulary* or the current edition of the *Food Chemicals Codex (FCC)*, it suffices to refer to the corresponding monograph in one of these three compendia. In such cases it is to be understood that the specifications are minimum requirements and that any substance meeting more rigid specifications for chemical purity is suitable.

### 2. PACKAGING AND STORAGE

Reagents and solutions should be preserved in tight containers made of resistant glass or other suitable material. Directions for storage in light-resistant containers should be carefully observed.

Stoppers and stopcocks brought into contact with substances capable of attacking or penetrating their surfaces may be given a protective coating of a thin film of a suitable lubricant unless specifically interdicted.

### 3. METAL-ION STANDARD SOLUTIONS

Atomic absorption and flame photometry require the use of a number of metal-ion standard solutions. While the individual monographs usually provide directions for preparation of these solutions, use of commercially prepared standardized solutions of the appropriate ions is permissible, provided that the analyst confirms the suitability of the solutions and has data to support their use.

### 4. DEFINITIONS

**4.1 REAGENTS:** Reagents are substances used either as such or as constituents of solutions.

**4.2 INDICATORS:** Indicators are reagents used to determine the specified endpoint in a chemical reaction, to measure hydrogen-ion concentration (pH), or to indicate that a desired change in pH has been effected. They are listed together with indicator test papers.

**4.3 BUFFER SOLUTIONS:** Buffer solutions resist changes in the activity of an ion on the addition of substances that are expected to change the activity of that ion.

**4.4 COLORIMETRIC SOLUTIONS (CS):** Colorimetric solutions are solutions used in the preparation of colorimetric standards for comparison purposes.

**4.5 TEST SOLUTIONS (TS):** Test solutions are solutions of reagents in such solvents and of such definite concentrations as to be suitable for the specified purposes.

**4.6 VOLUMETRIC SOLUTIONS (VS):** Volumetric solutions are solutions of reagents of known concentration intended primarily for use in quantitative determinations.

### 5. CHROMATOGRAPHIC SOLVENTS AND CARRIER GASES

The chromatographic procedures set forth in the *U.S. Pharmacopeia* may require use of solvents and gases that have been especially purified for such use. The purpose may be (a) to exclude certain impurities that interfere with the proper conduct of the test procedure, or (b) to extend the life of a column by reducing the buildup of impurities on the column. Where solvents and gases are called for in chromatographic procedures, it is the responsibility of the analyst to ensure the suitability of the solvent or gas for the specific use. Solvents and gases

suitable for specific high-pressure or other chromatographic uses are available as specialty products from various reagent supply houses, although there is no assurance that similar products from different suppliers are of equivalent suitability in any given procedure.

**Auxiliary Information** - Please [check for your question in the FAQs](#) before contacting USP.

Topic/Question	Contact	Expert Committee
INTRODUCTION - REAGENTS, INDICATORS AND SOLUTIONS	<a href="#">Margareth R.C. Marques</a> Principal Scientific Liaison	HDQ USP Headquarters

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