

## Introduction

Bio-Rad's 2-D SDS-PAGE standards are formulated to provide a two-dimensional protein pattern with detection either by silver or Coomassie staining.

The standard proteins are defined by isoelectric point (pI) and molecular weight. Added to the sample, they are used to determine pIs and molecular weights of sample proteins or to serve as a marker for 2-D gel matching. The characteristic pattern of main and minor spots of each standard protein makes them easy to identify among sample spots.

In addition, the standards can be used alone as an internal control for reproducibility of 2-D experiments or to test ampholyte mixtures.

The most striking advantage of the standards is that they allow valid comparison of 2-D electrophoretic patterns between different laboratories.

## 2-D SDS-PAGE Standards, Specifications

|                               |   |
|-------------------------------|---|
| <b>pI range</b>               | 4.5 to 8.5  |
| <b>Molecular weight range</b> | 17,500 to 76,000  |
| <b>Contents</b>               | Hen egg white conalbumin type 1<br>Bovine serum albumin (BSA)<br>Bovine muscle actin<br>Rabbit muscle glyceraldehyde 3-phosphate dehydrogenase (GAPDH)<br>Bovine carbonic anhydrase<br>Soybean trypsin inhibitor<br>Equine myoglobin<br>9 M urea<br>5% 2-mercaptoethanol<br>2% Bio-Lyte® 5/7 ampholyte<br>Distilled water |
| <b>Volume</b>                 | 500 µl solution, ready to use   |
| <b>Shipping</b>               | 4°C   |
| <b>Storage</b>                | -20°C   |
|                               | Aliquoting is recommended prior to freezing. Frequent freeze/thaw procedures should be avoided. Aliquots can be stored at 4°C for about one week  |
|                               | <b>Important!</b> Always vortex the 2-D SDS-PAGE standards after thawing or refrigerating to resuspend the urea   |
| <b>Shelf life</b>             | One year  |
| <b>Applications per vial</b>  | 200 (2.5 µl per mini gel) using Coomassie stain<br>1,000 (0.5–2.5 µl per mini gel) using silver stain<br>Double these amounts for full-length gels (16–20 cm)   |

## Ordering Information

| Catalog # | Description                                 |
|-----------|---|
| 161-0320  | 2-D SDS-PAGE Standards                      |
| 161-0303  | SDS-PAGE Standards, high range              |
| 161-0304  | SDS-PAGE Standards, low range               |
| 161-0363  | Precision Plus Protein™ Unstained Standards |
| 161-0373  | Precision Plus Protein All Blue Standards   |
| 161-0374  | Precision Plus Protein Dual Color Standards |

## Instruction Manual

## 2-D SDS-PAGE Standards

**BIO-RAD**

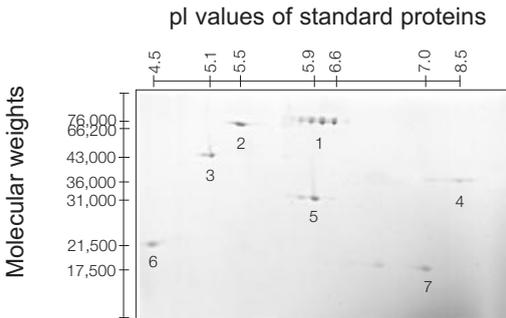
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4110064 Rev A

**BIO-RAD**

## Two-Dimensional Electrophoretic Protein Pattern



### Protein spots

- 1 Conalbumin
- 2 BSA
- 3 Actin
- 4 GAPDH
- 5 Carbonic anhydrase
- 6 Trypsin inhibitor
- 7 Myoglobin

Two-dimensional electrophoretic protein pattern of 2-D SDS-PAGE standards separated in the Mini-PROTEAN® II cell. 2.5 µl of the standards were run according to the method of Klose (Klose J, Humangenetik 26, 231–243, 1975; Klose K and Feller M, Electrophoresis 2, 12–24, 1981; Jungblut PR and Seifert R, J Biochem Biophys Methods 21, 47–58, 1990)

## Protein Molecular Weights and Isoelectric Points (pI)

| Protein                         | Molecular Weight | pI         | Reference   |
|---------------------------------|------------------|------------|---|
| Hen egg white conalbumin type 1 | 76,000           | 6.0        | Cavorta P, et al., Experientia 34, 849–850 (1978)                     |
|                                 |                  | 6.3        |   |
|                                 |                  | 6.6        |   |
| Bovine serum albumin (BSA)      | 66,200           | 5.4        | Brown JR, Fed Proc 34, 591 (1975)                                     |
|                                 |                  | 5.6        |   |
| Bovine muscle actin             | 43,000           | 5.0<br>5.1 | The running pI value of muscle actin has been empirically determined. |
| Rabbit muscle GAPDH             | 36,000           | 8.3<br>8.5 | Smith CM and Velick SF, J Biol Chem 247, 273–284, (1972)              |

| Protein                   | Molecular Weight | pI  | Reference  |
|---------------------------|------------------|-----|--|
| Bovine carbonic anhydrase | 31,000           | 5.9 | Ashworth RB, et al., Arch Biochem Biophys 142, 122–131 (1971)<br>Jonsson M and Petterson E, Acta Chem Scand, 22, 712–713 (1966)<br>Davis RP, Carbonic Anhydrase, p. 545–564 in The Enzymes, Vol V, 2nd edn (Boyer PD, ed), Academic Press, New York (1971) |
|                           |                  | 6.0 |  |
| Soybean trypsin Inhibitor | 21,500           | 4.5 | Catsimpoulas N and Leuthner E, Anal Biochem 31, 437–447 (1969)<br>Wu YV and Scheraga HG, Biochemistry 1, 698–705 (1962)  |
| Equine myoglobin          | 17,500           | 7.0 | Salaman MR and Williamson AR, Biochem J 122, 93–99 (1971)  |