3050 Spruce Street, St. Louis, MO 63103 USA
Tel: (800) 521-8956 (314) 771-5765 Fax: (800) 325-5052 (314) 771-5757
email: techservice@sial.com sigma-aldrich.com

Product Information

05420
Albumin from human serum
(HSA, Human Albumin, Human Serum Albumin)

CAS Number: 70024-90-7

Product No.	Preparation / Purification	Specification
05420	Prepared by using method IV of Cohn, et al. (crystallized and lyophilized Cohn Fraction V) [3]	Lyophilized powder ≥95.0% (agarose gel electrophoresis) pH 7.0 +/- 0.2

The source material has been tested negative for HIV and HBSAG.

Product Description: [5, 15]

Molecular weight: ~68'000 g/mol

Strukture: [5]
The amino acid sequence and structure of human albumin have been determined. Human albumin is a protein with no carbohydrate content. It is a single polypeptide chain with one free sulfhydryl group on residue # 34 and 17 intrachain disulfide bonds.

Amino Acid:	Asp	Asn	Thr	Ser	Glu	Gln	Pro	Gly	Ala	Cys	Val	Met	Ile
Residues:	39	15	30	22	60	23	25	12	63	35	39	6	8

Amino Acid:	Leu	Tyr	Phe	His	Lys	Trp	Arg
Residues:	61	18	30	16	58	1	23

Sedimentation constant, S20,W x 1013:	4.6 (monomer), 6.5 (dimer)
Diffusion constant, D20,W x 107:	6.1
Partial specific volume, V20:	0.733
Intrinsic viscosity, η:	0.042
Frictional ratio, f/f0:	1.28
Overall dimensions, Å:	38 X 150
Isoelectric point (Γ/2 = 0.15):	4.7
Isoionic point (Γ/2 = 0):	5.2
Electrophoretic mobility, pH 8.6, Γ/2 = 0.15:	-5.9
Refractive index increment (578 nm) x 10-3:	1.89
Optical absorbance, A279 nm (1 gram/liter):	0.531
Mean residue rotation, [m']233:	8590
Mean residue ellipticity	17 [θ]209 nm; 16 [θ]222 nm
Estimated α -helix	48%
Estimated β -form	15%

Storage Temp: 2-8°C

Sigma-Aldrich tests the solubility of human albumin powders in water at 50 mg/mL and obtains clear to slightly hazy, yellow solutions. In the experience of Sigma-Aldrich chemists, aqueous aliquots stored at –20°C are stable for several months. Repeated freezing and thawing of solutions is not recommended.

Applications: [7]

Albumins are a group of simple proteins found in the body fluids and tissues of animals and in some plant seeds. Unlike globulins, albumins have low molecular weights, are soluble in water, are easily crystallized and contain an excess of acidic amino acids. Serum and plasma albumin is carbohydrate-free and comprises 55-62% of the protein present. Due to its high charge to mass ratio albumin binds water, Ca2+,Na+, K+, fatty acids, bilirubin, hormones and drugs. The main biological function of albumin is to regulate the colloidal osmotic pressure of blood. Human and bovine albumins contain 16% nitrogen and are often used as standards in protein calibration studies. Due to their free hydrophobic region fatty acid free albumins are used to solubilize lipids in tissue culture, and are also used as blocking agents in Western blots or ELISA applications. Globulin free albumins are suitable for use in applications where no other proteins should be present (e.g., electrophoresis).

References:

1. E.J. Cohn, J. Amer. Chem. Soc., 68, 459 (1946).
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3. E.J. Cohn, J. Amer. Chem. Soc., 69, 1753 (1947).
4. Globulins are precipitated in a heat step following addition of caprylate, then removed by filtration.
5. The Plasma Proteins, 2nd Ed., Vol. I, F. W. Putnam, Ed., pp. 133-181, Academic Press, New York
6. (1975).
7. S.C. Gill and P.H. von Hippel, Anal. Biochem., 182, 319 (1989).
8. T. Scott and M. Eagleson, Concise Encyclopedia: Biochemistry, 2nd Ed., pp. 19-20, Walter de
9. Gruyter, New York (1988).
10. Sigma calculation based on sequence given by B. Meloun, et. al., FEBS Letters, 58(1), 134 (1975).
11. D.A. Lightner, et al., J. Biol. Chem. 263, 16669 (1988)
12. E. Domenici, et al., In the synthesis of an human serum albumin HPLC chiral stationary phase, Chromatographia, 29 170 (1990)
13. T.A.G. Noctor, I.W. Wainer, J. Liq. Chromat., 16, 783 (1993)
14. Merck Index: Merck 13, 8542
15. Quality control.

Precautions and Disclaimer

This product is for R&D use only, not for drug, household, or other uses. Please consult the Material Safety Data Sheet for information regarding hazards and safe handling practices.

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