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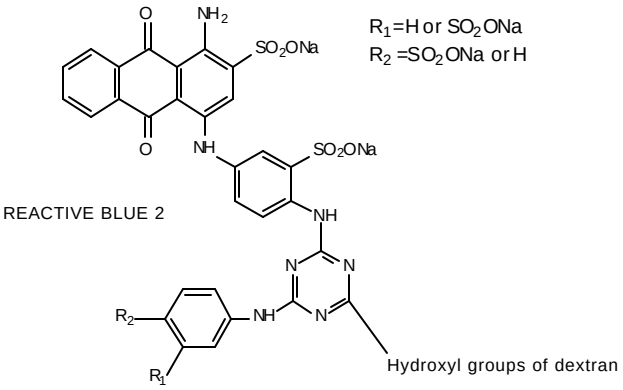
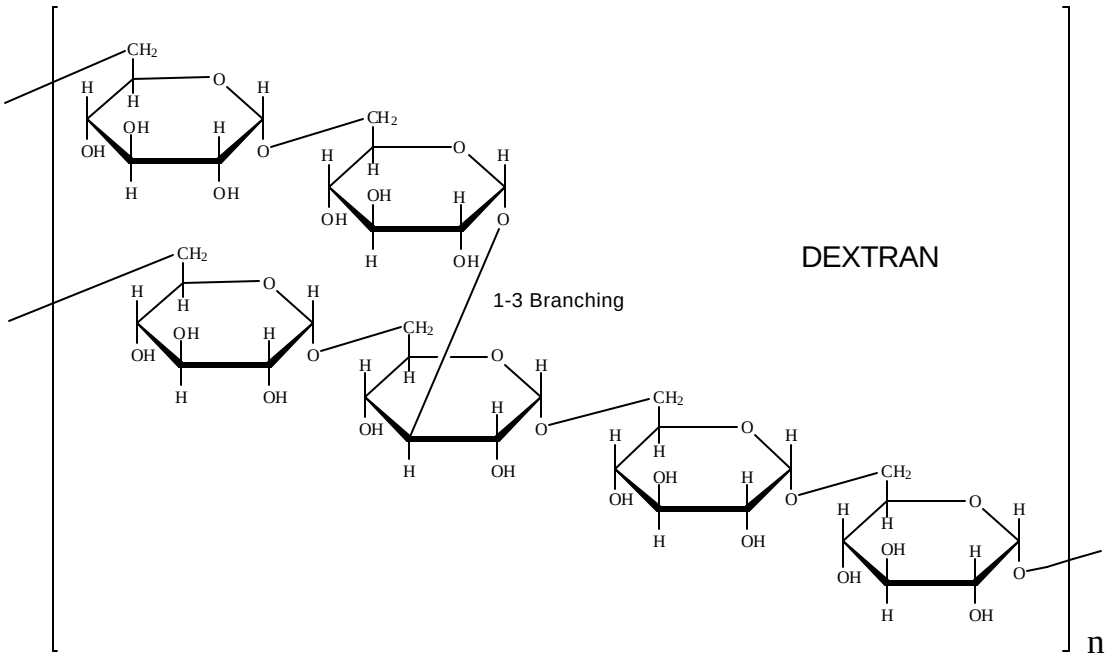
ProductInformation

BLUE DEXTRAN MOLECULAR WEIGHT 2,000,000
Sigma Prod. No. D5751





CAS NUMBER: 87915-38-6

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PHYSICAL PROPERTIES:
Absorbance: Lambda max. at approx. 620 nm, E 1% ranged from 8.92 to 9.48
Absorbance: Lambda max. at approx. 380 nm, E 1% ranged from 4.32 to 4.73
Appearance: Dark Blue Powder
Structure: Dextran is a polymer of anhydroglucose. It is composed of approximately 95% alpha-D-(166) linkages. The remaining a(163) linkages account for the branching of dextran.[1,2,3] Conflicting data on the branch lengths implies that the average branch length is less than three glucose units.[4,5] However, other methods indicate branches of greater than 50 glucose units exist.[6,7] Native dextran has been found to have a molecular weight (MW) in the range of 9 million to 500 million.[8,9,10] Dextrans with MW greater than 10,000 behave as if they are highly branched. As the MW increases, dextran molecules attain greater symmetry.[7,11,12] The MW of dextran is measured by one or more of the following methods: low angle laser light scattering (LALLS)[13], size exclusion chromatography[14], copper-complexation[15] and anthrone reagent[16] colorometric reducing-end sugar determination and viscosity[11]. The Reactive Blue 2 dye of blue dextran is attached randomly to hydroxyl groups along the dextran chain.
Specific Rotation for dextran: [a]=+199E [17]

METHOD OF PREPARATION:

Sigma dextrans are derived from Leuconostoc mesenteroides, strain B 512. Various MWs are produced by limited hydrolysis and fractionation. Our supplier's exact methods are held proprietary. Fractionation can be accomplished by size exclusion chromatography[14] or ethanol fractionation in which the largest MW dextrans precipitate first.[18] The reactive blue dye is coupled directly to the hydroxyl groups of dextran by a method similar to that used to prepare reactive dye affinity matrices.[19]

STABILITY / STORAGE AS SUPPLIED:

This product is given a shelf-life of five years from the date of manufacture.

SOLUBILITY / SOLUTION STABILITY:

Sigma tests the solubility of Blue Dextran at 50 mg/ml in water. Dextran can be hydrolyzed by strong acids at high temperatures. The terminal reducing end group of dextran can be oxidized in alkaline solutions.[17] Solutions should be prepared fresh when ever possible. Dextran is susceptible to microbial degradation. Solutions should be stored refrigerated.

APPLICATIONS:

The most common use for Blue Dextran is in the determination of the void volume in gel filtration chromatography columns. It is typically used at 1 mg/ml to 2 mg/ml in a buffer such as 50 mM Tris-HCl, pH 7.5 containing 100 mM KCl. The volume of the Blue Dextran sample should be 1% to no more than 3% of the column's bed volume. The shape of the Blue Dextran band as it elutes through the column can also be used to assess the column packing and resolution.

APPLICATIONS: (continued)

Blue Dextran has also been used as a spectrophotometric substrate for dextranase. Dextranase activity is measured by the increase in absorbance at 610 nm.[19]

The affinity of the Reactive Blue 2 Dye in Blue dextran for certain proteins has been exploited in protein purification methods. When bound to a protein the Blue Dextran-protein complex will be eluted in the void volume of a sephadex gel filtration column. This allows the bound protein to be easily separated from other proteins of similar molecular weight. The binding of blue dextrans to proteins is dependent on pH and ionic strength.[20,21]

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