



Hydroxyethylcellulose (HEC) is a

non-ionic, water-soluble polymer derived from cellulose, which is the primary structural component of plant cell walls. It is widely used in cosmetics, personal care products, pharmaceuticals, and industrial applications due to its ability to thicken, emulsify, and stabilize formulations.

Chemical Properties:

- **Molecular Structure:** HEC is a long-chain polymer with a high molecular weight, composed of glucose units modified with hydroxyethyl groups. The degree of substitution (the average number of hydroxyl groups substituted per glucose unit) and the molecular weight of HEC determine its solubility, viscosity, and performance characteristics.
- **Solubility:** Hydroxyethylcellulose is highly soluble in cold and hot water, forming a clear or slightly opalescent viscous solution. It is insoluble in organic solvents.
- **Viscosity:** One of the key properties of HEC is its ability to increase the viscosity of aqueous solutions. The viscosity of HEC solutions depends on factors such as concentration, molecular weight, temperature, and pH. It can create a range of viscosities from low to very high, making it suitable for a variety of applications.
- **Non-Ionic Nature:** Being non-ionic, HEC is stable over a wide pH range (typically 3 to 12) and is less affected by the presence of salts and electrolytes in formulations, unlike ionic thickeners.
- **Film-Forming Ability:** HEC can form thin, flexible films, which can be used in applications like coatings and as a binder in various formulations.