

Features of Understanding and Describing the Hydrate Formation Process

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Abstract. Clathrate hydrates are not only a huge source of energy, but also potentially interesting from a technological point of view due to their ability to bind water. According to generally accepted modern concepts, hydrates formed by individual hydrate-formers or their mixtures are non-stoichiometric inclusion compounds of a cellular type with the crystal lattice built of water molecules held by hydrogen bonds. The molecules of the hydrate-former are located in the internal cavities of the crystal lattice and are held in them by van der Waals forces. The article presents a formalized description of the hydrate formation process. A model of hydrate formation in gas-water systems is proposed. The model describes the processes occurring during hydrate formation in structures. It contains equations for calculating the main energy and molecular parameters of the hydrate-former, as well as the kinetics of the process.

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