THE DEVELOPMENT OF FIBROUS COALESCENCE MATERIALS FOR THE SEPARATION OF DISPERSED OILS IN WASTEWATER

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In recent years, increasing discharge of large amount of oily wastewater from manufacturing industries, agriculture, transportation and sewage systems has been witnessed. In addition, oil spills, natural sedimentation of petroleum hydrocarbons from atmosphere and submarine oil spill have become more serious. Oil-polluted water greatly threatens human health, the breathing environment and aquatic plants and animals. Therefore, the search and development of effective techniques to treat oily wastewater is of significant importance.

Oil pollution in water can be divided into suspended oil, dispersed oil, emulsified oil and dissolved oil according to its droplet size, among which emulsified oil is the most difficult to separate. As a physical method, coalescence separation generates no secondary pollution, is easy to operate with cheap equipment cost, and is particularly effective for treating emulsified oil droplets in water. Regarding coalescence materials, fibrous media have many advantages such as the ease of fabrication, the flexibility of being processed into different structures, and the excellent performance if designed properly. However, the traditional fibrous coalescence materials have large bed height and low stacking density, which tend to cause large flow resistance and energy cost. The fibrous filter media made by wet-laid processes can greatly improve the pore structure of the material and reduce the bed height, and also allow for easy post-treatment of the media. We have been working on the development of such media in the past years, and accomplished a few milestones as will be discussed in this presentation.