Development of Novel Oil-Water Separating Apparatus Based on Superhydrophobic Metal-Mesh

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China is famous for cooking, but a lot of waste oil is generated in China per year. Traditional separating method cannot isolate oil and water completely, spending much energy and money on it. Waste oil not only cannot be recycled efficiently, but also creates serious food safety issues. This research prepared a new type of stainless steel mesh based on modified super hydrophobic silica nanoparticles colloid. The research designed a new oil-water separation device in order to improve traditional separating device and increase separation efficiency. Five kinds of filters with different diameters were compared with each other. The experiment showed that the contact angle between 200 mesh steel filter and water reached 150.74°, and other filters' contact angle of water are not less than 135°. The elapse of n-hexane and water droplets is recorded by high-speed camera. Using (Heptadecafluoro-1,1,2,2-tetradecyl) trimethoxysilane modified SiO_2 colloid to obtain super hydrophobic stainless steel mesh is not only convenient but efficient in separation. The separating efficiency of the novel separation apparatus varies with the diameters of the filter. 180 mesh steel filter has the maximum separation efficiency. Based on the study, the industrial application of super hydrophobic silica is primarily explored, showing in the next study.

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