

An improvement method of oil dispersion effect evaluation on water-base dispersant

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摘要

The use of chemical dispersants is a recognized oil spill remediation measure, which can reduce the interfacial tension of oil and water and form small oil droplets in the water. Since most oil-based dispersant formulations contain organic solvents that can cause environmental concerns, using water-based or natural oil-based dispersants can help minimize environmental impact. The purpose of this study was to develop improved extraction methods for water-based and natural oil-based dispersants suitable for oil spill remediation and to evaluate the effects of solvent, temperature, ion concentration, and brine on dispersion efficiency. This method establishes the calibration line of the wavelength absorption diagram of 340nm 370nm 400nm and establishes the calibration line method above 0.998 R square value to understand the dispersion efficiency. The HLB value is an important factor to consider when formulating oil-in-water emulsions. It determines the required balance between hydrophilic and lipophilic properties of the emulsifying agent. In this study, it can be observed that the HLB value has a direct impact on the efficiency of the emulsifying agent in dispersing oil. In the mixture of Span20/Tween20, when the ratio is 35/65, the HLB value is 13.9, and the oil dispersion efficiency reaches the highest (35%). Similarly, when Span80/Tween80 is 35/65, the HLB value is 11.2, and the oil dispersion efficiency also reaches the highest (42%). Our results indicate that increasing the proportion of Span in the emulsifying agent results in a lower HLB value and higher oil dispersion efficiency. It is noteworthy that the highest efficiency was observed when the HLB value reached between 11-14. This information can be useful when formulating emulsions to achieve the desired efficiency in dispersing oil.

關鍵字:分散劑、淡水、微胞

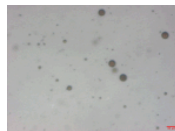


圖 1 、 Picture of Tween-dispersed oil droplet distribution

References:[1] Asadov, Z. H.; Tantawy, A. H.; Zarbaliyeva, I. A.; Rahimov, R. A.; Synthesis of new surface-active ammonium-type complexes based on palmitic acid for removing thin petroleum films from water surface. Egypt. J. Pet. 2013, 22 (2), 261–267.