

**FORMULASI *DISPERSANT* RAMAH LINGKUNGAN
BERBASIS METIL ESTER SULFONAT (MES) MINYAK
JELANTAH DAN TWEEN-80 SEBAGAI
PENANGGULANGAN PENCEMARAN TUMPAHAN
MINYAK BUMI**

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Valen Delvi Farma, Neswati, Kurnia Harlina Dewi

ABSTRAK

Tumpahan minyak bumi menimbulkan pencemaran lingkungan yang serius, sehingga diperlukan dispersan ramah lingkungan sebagai alternatif dispersan kimia konvensional yang berpotensi toksik terhadap biota laut. Penelitian ini bertujuan untuk menganalisis pengaruh rasio Metil Ester Sulfonat (MES) minyak jelantah dan Tween 80 terhadap karakteristik *Oil Spill Dispersant* (OSD), mendapatkan rasio surfaktan terbaik berdasarkan karakteristik OSD, serta menganalisis nilai tambah produk yang dihasilkan. Penelitian dilaksanakan secara eksperimental menggunakan Rancangan Acak Lengkap (RAL) dengan 5 taraf rasio MES dan Tween 80 (65%:35%, 70%:30%, 75%:25%, 80%:20%, dan 85%:15%) serta 3 kali ulangan. Hasil penelitian menunjukkan bahwa rasio surfaktan berpengaruh nyata terhadap pH, densitas, dan tegangan permukaan OSD, tetapi tidak berpengaruh nyata terhadap viskositas OSD. Formulasi terbaik diperoleh pada rasio MES:Tween 80 80%:20%, dengan nilai pH 6,03, densitas 0,9891 g/cm³, viskositas 2,3810 cP, dan tegangan permukaan 27,1416 dyne/cm, yang mendekati karakteristik OSD komersial. Analisis nilai tambah menunjukkan nilai tambah sebesar Rp 367.540/kg minyak jelantah dengan rasio nilai tambah 50,12% (kategori tinggi).

Kata kunci: metil ester sulfonat; minyak jelantah; nilai tambah; *oil spill dispersant*; Tween 80

FORMULATION OF AN ENVIRONMENTALLY FRIENDLY DISPERSANT BASED ON METHYL ESTER SULFONATE (MES) FROM USED COOKING OIL AND TWEEN-80 AS A MEANS OF MITIGATING OIL SPILL POLLUTION

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ABSTRACT

Oil spills cause serious environmental pollution, so environmentally friendly dispersants are needed as an alternative to conventional chemical dispersants that are potentially toxic to marine biota. This study aims to analyze the effect of the ratio of Methyl Ester Sulfonate (MES) of used cooking oil and Tween 80 on the characteristics of oil spill dispersant (OSD), to obtain the best surfactant ratio based on OSD characteristics, and to analyze the added value of the resulting product. The study was conducted experimentally using a Completely Randomized Design (CRD) with 5 levels of MES and Tween 80 ratios (65%:35%, 70%:30%, 75%:25%, 80%:20%, and 85%:15%) and 3 replications. The results showed that the surfactant ratio significantly affected the pH, density, and surface tension of OSD, but did not significantly affect the viscosity of OSD. The best formulation was obtained at a MES:Tween 80 ratio of 80%:20%, with a pH value of 6.03, a density of 0.9891 g/cm³, a viscosity of 2.3810 cP, and a surface tension of 27.1416 dyne/cm, which were close to the characteristics of commercial OSD. The value-added analysis showed an added value of Rp 367,540/kg of used cooking oil with a value-added ratio of 50.12% (high category).

Keywords: methyl ester sulfonate; oil spill dispersant; Tween 80; value added; waste cooking oil