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Polytriethanolamine was prepared by condensation polymerization of triethanolamine in presence of NaOH as at a catalyst 245 °C for different times 1.30, 2.30, and 3.30 hours to produce P_4, P_6, and P_8 where 4, 6, and 8 refer to the degree of polymerization. The prepared polymers were esterfied at different molar ratios with oleic acid. The prepared polymer (P_8) was ethoxylated by three different molar ratios of ethylene oxide (40, 100, and 120) and named E(en)P_8. The ethoxylated polymers were esterfied at different molar ratios with oleic acid and abbreviated as E(en)P_8O_m. The surface tension measurements were recorded.

The structure of the prepared compounds was confirmed using the elemental analysis, (FT-IR, ^1H, ^{13}C NMR) spectroscopic. The FT-IR spectra of the polymers showed a new band at 1114.0 cm^{-1} due to the ethereal bond. The intensity of this band increased with increasing the degree of polymerization. The ester of the ethoxylated polymers show a characteristic band for the carbonyl group appearing at 1735 cm^{-1}.The intensity of this band increases with increasing the molar ratios of esterfication process. The ^1H and ^{13}C NMR spectra of the compounds justified the structural information. The prepared compounds were evaluated as corrosion inhibitors and demulsifiers.

From the corrosion data it was found that the inhibition efficiency of the three polymers (P_4, P_6, and $P_{8)}$ increased with increasing the concentration up to a certain value then decreased. On the other hand the inhibition efficiency (I %) for esters of polytriethanolamine, ethoxylated polytriethanolamine, and esters of ethoxylated polytriethanolamine increases with increasing the concentration. The corrosion rate was found to increase with increasing the temperature. The thermodynamic parameters were calculated depending on the activation energy (Ea*) values.

From the demulsification data, it was found that the demulsification efficiency of these compounds increases with increasing the concentration. The polymer P_8 and it's ethoxylated form (e.o = 40 units) didn't exhibit any demulsification efficiency. However the same polymer

after esterfication by 4 mol oleic acid (P_8O_4) and ($E(40)P_8O_4$) exhibited 100 % demulsification efficiency. The products (P_8O_4) and ($E(40)P_8O_4$) were modified by esterfication to give surfactants with (hydrophil-lipophil moiety).

The corrosion and demulsification performance of these compounds warrants their use as multifunction in the petroleum industry.