# DESIGN AND ASSESSMENT OF NOVEL POLYMERS BASED ON 5-DIHYDRAZINYL-1, 3,4-THIADIAZOLE AS INHIBITORS FOR STEEL PIPELINES CORROSION IN $CO_2$-SATURATED OILFIELD

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The most vastly utilized pipeline materials in the gas and oil industry is the carbon steel. The carbon steel pipelines internal corrosion is a considerable problem that has caused many failures. In the oil and gas industry, $CO_2$ insertion is predominantly used to in reinforced oil recovery. However, $CO_2$-corrosion is a leading cause in pipeline defeats, leading to significant economic losses and accidents. $CO_2$-saturated oil field water is routinely recycled for insertion to increment reservoir pressure in enhanced oil recovery, but this brings $CO_2$ corrosion. So, before addition, some chemicals are added to this fluid like corrosion inhibitors to prevent scale deposition inside oil pipelines and also to prevent their corrosion.

A novel class of interesting polymers derivatives SR-16 and SR-17 was synthesized and characterization by different spectroscopic methods. The polymers SR-16 and SR-17 exhibits excellent corrosion inhibitive activities on steel in $CO_2$-containing oilfield formation water. The protection efficiency is found to increase by increasing the polymer concentration up to maximum 92.12 and 96.52 % for 150 ppm at 50 °C in the presence of SR-16 and SR-17, respectively. The SEM and EDX measurements indicate studied polymers protect that steel surface. The current study provides very significate data in fabricating and designing novel polymer inhibitors with high protection efficiency.

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