Gravimetric and Statistical Analysis of Combined Protection Performance of *Lavandula latifolia* and *Ricinus communis* on Low Carbon

Abstract:

The protection performance of admixed *Lavandula latifolia* and *Ricinus communis* (LLRC) oil distillates on low carbon steel in 0.5 M H_2SO_4 and HCl was performed by gravimetric measurement. Data output shows LLRC distillate effectively stifled the corrosion of the carbon steel with peak protection performance of 96.35% at 1% LLRC concentration in H_2SO_4 solution and 88.72% at 6% LLRC concentration in HCl solution. LLRC performed more effectively in H_2SO_4 solution than in HCl. The performance of LLRC in H_2SO_4 exhibited significant non dependence on observation time while LLRC concentration strongly influenced its performance. In HCl solution observation time and LLRC concentration influenced the performance output of LLRC distillate in different proportions. Statistical evaluation rated the influence of LLRC concentration the protection performance of LLRC at 90.66% compared to 2.22% for observation time, while the corresponding values in HCl are 55.37% for LLRC concentration and 21.04% for observation time. Calculated data for standard deviation shows relatively minimal variation from mean values with respect to LLRC concentration and observation time at lower LLRC concentration in H_2SO_4 solution. At higher LLRC concentration, the degree of variation increases due to relative instability with respect to exposure time. The standard deviation values in HCl are significantly and relatively higher than the values obtained in H_2SO_4 solution due to significant deviation from mean values which signifies extensive instability with respect to exposure time. The margin of error shows 91.7% and 93.3% of LLRC protection performance data in H_2SO_4 and HCl solution are greater than 80% inhibition efficiency at margin of error of +6.99% and +6.31%.