electrochemical behaviour of carbon steel in aquous media

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The introduction included a literature survey of the diffetent theoriesof corrosion and corrosion inhibition. The electrochemical behaviorof carbon steel in aqueous solutions (acidic, alkaline and neutral) wasgiven with particular emphasis on the effect of aggressive as well asinhibitive anions.2- Potential-time curves were obtained fur carbon steel electrode indifferent percentages of NaCl. It is found that, the steady statepotential is shifted to more negative values with increasing NaClconcentrations.3- Addition of inorganic compounds such as sodium salts of molybdate,tungestate, vanadate and organic compounds such as Neville-Winterazo dyes derivatives on the potential-time curves of carbon steelelectrode in 3.5% NaCl. It is found that the steady state potential isshifted to more positive values with increasingthe above additives.4- The anodic and cathodic Tafel lines were constrneted fur carbon steelin deaerated NaCl solution. Increase of NaCl concentration wasaccompanied by:(i) Change of anodic and cathodic Tafel slopes.(ii) The corrosion potential is shifted to more negative values.(iii}The corrosion current density increases.5- Addition of some inorganic and organic compounds mentioned aboveaffected the kinetic parameters of the dissolution of carbon steel in3-.5%NaCl solution. It is clear that, as the concentration of additivesmcreases:(i) The corrosion potential is shifted to more positive values.(ii) The corrosion current density decreases and consequently, theinhibition efficiency increases. The above values of Ecoa. andk.indicated the inhibiting effect of such compounds.6- Adsorption of the above additives obeys Freundlich adsorptionisotherm.7- Potentiodynamic anodic polarization curves of carbon steel in diil’etentconcentrations of NaCl solution was studied. It was found that the crions cause the destmetion of the passivating oxide film and initiatepitting corrosion. The pitting corrosion potential is shifted to morenegative values with increasing chloride ions concentration.8- Trials were made to inhibit pitting corrosion usmg inorganiccompounds such as (Na2Mo04,Na2W04, Na2V03). These compoundsshifted the pitting potential to more positive values, indicating theinhibitingeffect of these compounds.