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Peptidi i njihove sastavne komponente kao inhibitori korozije čelika: eksperimentalni i teorijski pristup

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Ekološki prihvatljivi inhibitori privlače pažnju mnogih istraživača zbog povoljnih svojstava: biorazgradivost, netoksičnost, dostupnost i obnovljivost. U njih spadaju i amonokiseline (AK), kao sastojci od vitalnog značaja za sva živa bića. U radu je ispitan inhibitorski efekat nekoliko AK na čeliku u 1 M HCl: tri samostalne AK, glicin, glutaminska kiselina i cistein; smeša ove tri AK, kao i njihov dipeptid (glicin i glutaminska kiselina) i tripeptid glutation (glicin, glutaminska kiselina i cistein). Inhibitorska efikasnost AK je određena elektrohemijskim merenjima. Meren je ugao kvašenja površine čelika sa adsorbovanim inhibitorom, energija veza inhibitora i supstrata je određivana XPS metodom, a topografija AFM. Razlike u vezivanju inhibitora za supstrat su analizirane teorijskim proračunima.

Peptides and their constituents as steel corrosion inhibitors: an experimental and theoretical approach

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Green eco-friendly inhibitors have become very popular due to their remarkable properties such as biodegradability, environmental acceptability, safety, availability, and renewability. Amino acids (ACs) are one of them, as constituents of vital importance for all living beings. Several AC systems were examined in this study as steel inhibitors in 1 M HCl solution: three ACs separately, glycine, glutamic acid and cysteine; their mixture, as well as their dipeptide (glycine and glutamic acid) and tripeptide glutathione (glycine, glutamic acid and cysteine). Their inhibition efficiency was evaluated and compared by electrochemical methods. The steel surface with adsorbed inhibitor was analyzed by contact angle measurements, AFM and XPS. The intrinsic differences in adsorption between these green inhibitors were analyzed by theoretical calculations.