

CHEMISORPTION OF HALOGEN ON CARBONS. PART 1. STEPWISE CHLORINATION AND EXCHANGE OF C-Cl WITH C-H BONDS

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The amount of HCl released in the stepwise chlorination of carbons at 400°C can be interpreted by assuming that saturation of olefinic bonds by chlorine is the most preferred reaction. This is followed by exchange with C-H bonds and, lastly, by slight dehydrogenation of the adsorbent, yielding HCl and olefinic bonds. High temperature chlorination-hydrogenation cycles may be performed many times to a depth of 3.4 mg/g without appreciable weight loss or change in pore structure of the carbon.

THE ELECTRICAL DOUBLE LAYER OF CARBON AND GRAPHITE ELECTRODES. PART I. DEPENDENCE ON ELECTROLYTE TYPE AND CONCENTRATION⁽¹⁾

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The electrical double layer capacity per unit of the true surface area of graphitized carbon cloth and carbon black was investigated under various conditions. It was found to be independent of the type and valency of cations and anions as long as these are not specifically adsorbed. It was also independent of concentration and did not show the typical deep minimum at low concentrations. The only feature observed in the capacity-potential curve is a flat minimum. In order to interpret the results, surface heterogeneity and the existence of localized π electron states at the outer graphitic layer of the electrode had to be assumed.

REFERENCE:

1. Oren, Y., Tobias, H. and Soffer, A., J. Electroanal. Chem. 162, 87 (1984)

NEW DEVELOPMENTS IN THE TECHNOLOGY OF URANIUM RECOVERY FROM PHOSPHORIC ACID

Z. Ketzinel, Y. Volkman, M. Hassid, Y. Melamud, A. Elbaz, M. Pasi, M. Abda, Y. Toor, M. Azaria, M. Gafnir, V. Amsalem and M. Barak

In continuation of work presented previously⁽¹⁾ on the recovery of uranium from phosphoric acid, it was found that the

most promising development is based on ion exchange. Newly developed ion-exchange resins, some of them commercially available, were used. The basic flow-scheme of the process is very simple. Reduced uranium ions (U^{+4}) are loaded selectively from the "wet-process" phosphoric acid (WPA) medium on a suitable ion-exchange resin bed. It is then eluted with a solution of ammonium carbonate, and precipitated by partial evaporation of the rich eluate solution.

Following extensive laboratory and bench-scale tests with fresh industrial phosphoric acid, a pilot-plant adjacent to the phosphoric acid plant of Rotem Fertilizers Ltd. was constructed for process demonstrations and for evaluation of optimal design parameters on a semi-industrial scale.

Preliminary cost estimates of a full scale plant have been carried out for typical Israeli conditions. The estimated figures represent a reduction of almost 50% in both investment and operating costs, as compared to solvent extraction uranium recovery processes, of similar size plants.

REFERENCE:

1. Ketzinel, Z., et al. in: IA-1386, 1983, p. 156.

ELECTROCATALYTIC REDUCTION OF DIOXYGEN BY COBALT TETRA (4-NN'N"-TRIMETHYLANILINIUM) PORPHYRIN

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The cobalt-tetra(4-NN'N" trimethylanilinium) porphyrin (CoTMAP) was studied in aqueous solutions using cyclic voltammetry, differential pulse voltammetry as well as the RRDE and spectro-electrochemical methods. The Co^{III}/Co^{II} TMAP couple dissolved in 0.1N H_2SO_4 has a redox potential of +0.14V. The λ_{max} of the Soret band is 427 and 412 nm for Co^{III} and Co^{II} TMAP, respectively. The rate constant for the reaction between Co^{II} TMAP and dioxygen in 0.1N H_2SO_4 was estimated to be $3 \times 10^7 M^{-1} s^{-1}$. The Co^{III} TMAP has been found to adsorb at monolayer levels on glassy carbon surfaces and to have a catalytic effect on dioxygen electroreduction in aqueous solutions. This catalytic effect is strongly dependent