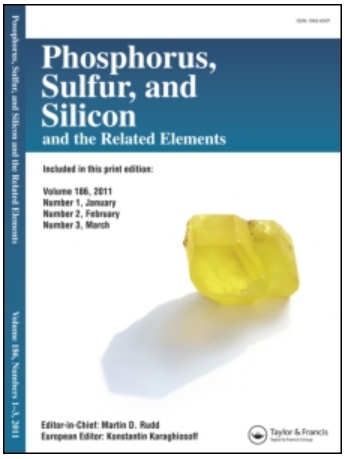

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Synthesis and Study of Acid-Basic Properties of Ti(IV) and Zr(IV) Phosphates Immobylized in the Matrix of Clinoptilolite

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Synthesis and Study of Acid-Basic Properties of Ti(IV) and Zr(IV) Phosphates Immobylized in the Matrix of Clinoptilolite

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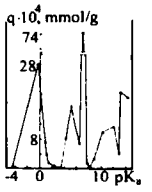
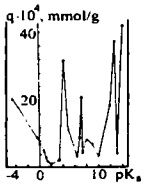
By combination of the ion-exchange and ionic-molecular layering methods [1], the synthesis of natural zeolite derivatives (clinoptilolite) containing in its composition nano-size fragments of Ti(IV) and Zr(IV) phosphates was performed. It was determined by the X-Ray method, that the phosphates of Ti(IV) and Zr(IV) replicate crystal lattice of zeolite, manifesting in enhancing the line's intensity on X-Ray patterns. The Brensted's and Lewis's spectra of acidic centers' distributions were obtained by Hammett's indicator spectrophotometric method [2] in the interval of $\mathbf{pK_a}$ values from –4.4 to 14.2, which have shown that P(V) of the derivatives is represented mainly by HPO_4- and H_2PO_4-groups, with predomination of these latter. It is shown that the force of Brensted's acidic centers, influenced by H_2PO_4-groups, remains at the level of $H_2PO^-_{4(aq)}$-anion, and the force of the centers due to HPO_4-groups shifts into alkaline region, about 0,5 unit of $\mathbf{pK_a}$.The strong acidic Lewis's centers were detected at the levels of $\mathbf{pK_a}$ from 0 to –4.0. The spectra of Ti(IV) and Zr(IV) phosphates is presented in (1) and (2) respectively. A set of the acquired results makes possible a suggestion about using P(V)-containing derivatives in processes which are catalyzed both with Brensted's and Lewis's centers participation.



(1)



(2)

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[1] V.P. Glybin, V.P. Nesterenko, etc., *Abstracts of the XIIIth International Conference on Phosphorus Chemistry – ICPC* (Jerusalem, Israel, 1995), p. 95.

[2] L.P Hammet, *Physical Organic Chemistry* (McGRAW-Hill Book Company, New York-San Francisco-London, 1970).