

Development of Potassium and Bromide Ions Memorized Inorganic  
Ion-exchangers

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Summary

To develop potassium ion memorized inorganic ion-exchangers, potassium ions of specially synthesized  $\text{KM}_5\text{O}_{15}\text{OH}\cdot 2\text{H}_2\text{O}$  with tunnel structure or  $\text{K}_2\text{Mn}_4\text{O}_8$  and  $\text{KMg}_2\text{LiSi}_4\text{O}_{10}\text{F}_2\cdot 2\text{H}_2\text{O}$  with layered structures, have been ion-exchanged for sodium ions in aqueous sodium chloride solutions or for protons in aqueous hydrochloric acid solutions at 70 °C.

Sodium ion-exchanged  $\text{Na}_x\text{K}_{1-x}\text{Mo}_5\text{O}_{15}\text{OH}\cdot 2\text{H}_2\text{O}$ ,  $\text{Na}_x\text{K}_{1-x}\text{Mg}_2\text{LiSi}_4\text{O}_{10}\text{F}_2\cdot 2\text{H}_2\text{O}$  and proton-exchanged  $\text{H}_x\text{K}_{2-x}\text{Mn}_4\text{O}_8$  were found to have the selectivity for potassium ions in aqueous solution at room temperature.

Especially, it has been found that  $\text{NaMg}_2\text{LiSi}_4\text{O}_{10}\text{F}_2\cdot 2\text{H}_2\text{O}$  ( $x=1$ ) has an outstanding selectivity for potassium ions in solution, i. e., the  $\text{NaMg}_2\text{LiSi}_4\text{O}_{10}\text{F}_2\cdot 2\text{H}_2\text{O}$  has the feasibility of a superior potassium memorized ion-exchanger.

To develop bromide ion memorized exchangers,  $\text{Pb}_{10}(\text{PO}_4)_6\text{Br}_{2-x}\text{Cl}_x$  has been synthesized and the anion-exchange characteristics of chloride ions in it for bromide ions in aqueous solutions have been investigated. The details will be discussed in following reports.