The structure of NASICON-type compounds, Na$_{1+x}$Sc$_x$Ti$_{2-x}$(PO$_4$)$_3$ (0 $\leq$ x $\leq$ 2), and the dynamics of Na$^+$ have been investigated by $^{23}$Na NMR spectroscopy. It was found that the $^{23}$Na 1D and 2D MQMAS spectra depend on the Na concentration, suggesting strongly that the Na$^+$ ions are distributed between two crystallographically nonequivalent sites, one is a special position with axial symmetry, and the other a position of low symmetry. The chemical exchange between these different sites in the crystal takes place at room temperature, which may cause the high Na$^+$ ion conduction of this material.

Key words: NASICON; Superionic Conductor; 2D MQMAS NMR; Chemical Exchange.