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Effect of multi-ions on active flow regulation in plants JEONGEUN RYU, Department of Mechanical Engineering, POSTECH, SUNGSOOK AHN, Center for Biofluid and Biomimic Research, POSTECH, SEUNG-GON KIM, Department of Mechanical Engineering, POSTECH, HWASUK OH, TAEJOO KIM, KAERI (The Korea Atomic Energy Research Institute), SANG JOON LEE, Department of Mechanical Engineering & Division of Integrative Biosciences and Biotechnology, POSTECH — Plants have been known to regulate ion-mediated flows actively in xylem vessels. Pits, the porous structures in xylem vessels, are presumed to play a key role in the ion-mediated flow regulation based on dynamic swelling and shrinking of their pectic matrix. However, the autonomous flow regulation in plants has not been elucidated yet and the pectin-swelling hypothesis seems to be simply applied to account for dynamic modulation of xylem conductance. In this study, the effects of multiple ions and their concentration on the water transport in plants were experimentally investigated. In addition, the active regulation mechanism of xylem water flow was also examined with considering the ionic effect.

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