

Effect of pre-intercalation on Li-ion diffusion mapped by topochemical single-crystal transformation and operando investigation

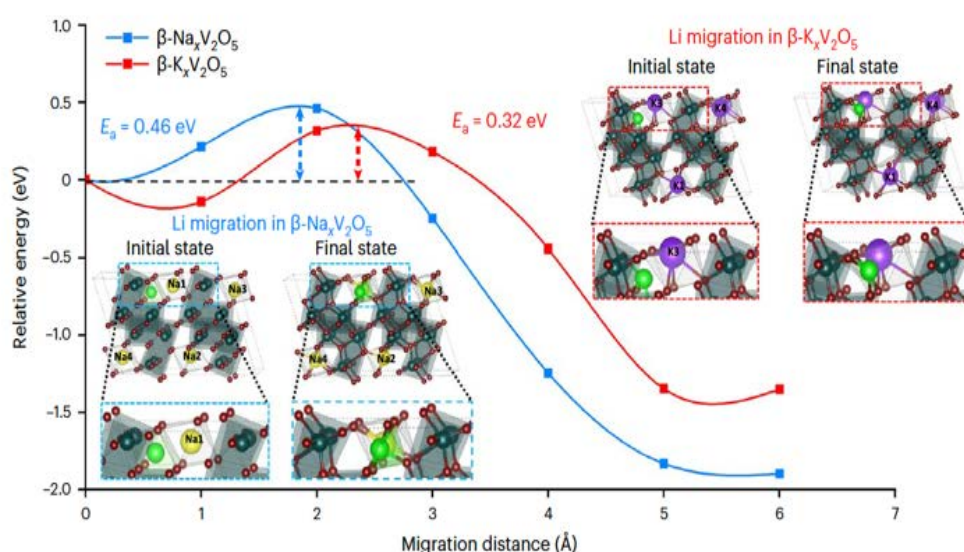
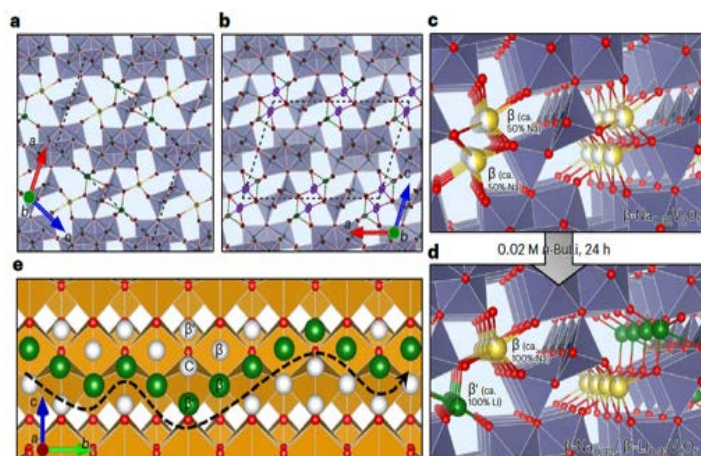
Received: 26 February 2022

Accepted: 19 February 2024

Published online: 21 March 2024

Yuting Luo^{1,2,6}, Joseph V. Handy^{1,2,6}, Tisita Das^{3,4}, John D. Poniš^{1,2,6}, Ryan Albers^{1,2}, Yu-Hsiang Chiang^{1,2}, Matt Pharr^{1,2}, Brian J. Schultz⁵, Leonardo Gobatto⁵, Dean C. Brown⁵, Sudip Chakraborty^{1,2,6} & Sarbajit Banerjee^{1,2,6}

Check for updates



Dr. Tisita Das (DST INSPIRE Faculty) and Dr. Sudip Chakraborty (Reader F) from Harish-Chandra Research Institute (HRI) Prayagraj [an Aided Institute of Department of Atomic Energy (DAE) and a C.I. of Homi Bhabha National Institute (HBNI)] have made a remarkable discovery in the field of Lithium-ion battery technology to expedite the charging process with an enhanced longevity as compared to the currently available cells in the industry. The work was carried out in a joint scientific venture with Prof. Sarbajit Banerjee's research group at Texas A&M, USA. The work has recently published in Nature Materials. The work introduces a new concept of “pre-intercalation mechanism” in an electrode material named “vanadium pentoxide”, by changing the width of insertion or diffusion channel of Lithium in electrode by introducing some foreign elements, in this case, sodium and potassium.

Article Details (Link: <https://www.nature.com/articles/s41563-024-01842-y>)

Effect of Pre-Intercalation on Li-Ion Diffusion by Operando Investigation and Topochemical Single-Crystal Transformation, Y. Luo[†], J. Handy[†], Tisita Das[†], J. Poniš[†], R.

Albers, Y. Chiang, M. Pharr, B. Schultz, L. Gobbato, D. Brown, Sudip Chakraborty*, Sarbajit Banerjee* [[†]equal contributing author, *corresponding author