

Lead-Free New Alkali Metals Double Perovskites $A_2\text{InAgF}_6$ ($A = \text{Na}, \text{K},$ and Rb) for Optoelectronic Applications: A First-Principles Study

Sharmin Islam^a, Shatha A. Aldaghfag^b, Ali El-Rayyes^c, Abdullah Al Mahmud^a, Samah Saidi^d, Omar Alsalmi^e, Mohd Taukeer Khan^{f*}, Md Saiduzzaman^{a*}

^aDepartment of Materials Science and Engineering, Khulna University of Engineering & Technology, Khulna 9203, Bangladesh

^bDepartment of Physics, College of Sciences, Princess Nourah bint Abdulrahman University, P. O. Box 84428, Riyadh 11671, Saudi Arabia

^cCenter for Scientific Research and Entrepreneurship, Northern Border University, 73213, Arar, Saudi Arabia

^dDepartment of Physics, College of Science and Humanities in Al-Kharj, Prince Sattam Bin Abdulaziz University, Al-Kharj 11942, Saudi Arabia

^eDepartment of Physics, College of Science, Umm Al-Qura University, Makkah, 21955, Saudi Arabia

^fDepartment of Physics, Faculty of Science, Islamic University of Madinah, Madinah, Saudi Arabia

* **Corresponding author:** Md Saiduzzaman (Email: msaiduzzaman@mse.kuet.ac.bd)
Mohd Taukeer Khan (Email: khanmtk@iu.edu.sa)

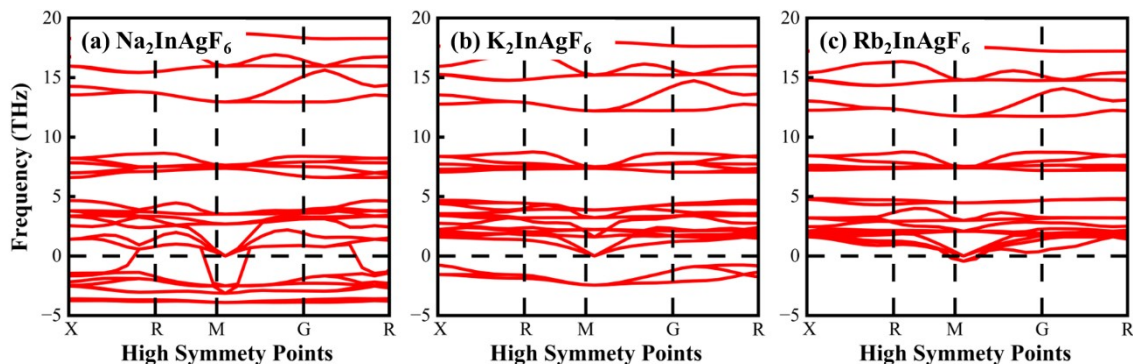


Fig. S1 Phonon dispersion spectra of $A_2\text{InAgF}_6$ ($A = \text{Na}, \text{K},$ and Rb) compounds