

High-Entropy Perovskite Oxides Based on BiFeO₃: A Pathway to Stable and Efficient Energy Functional Materials

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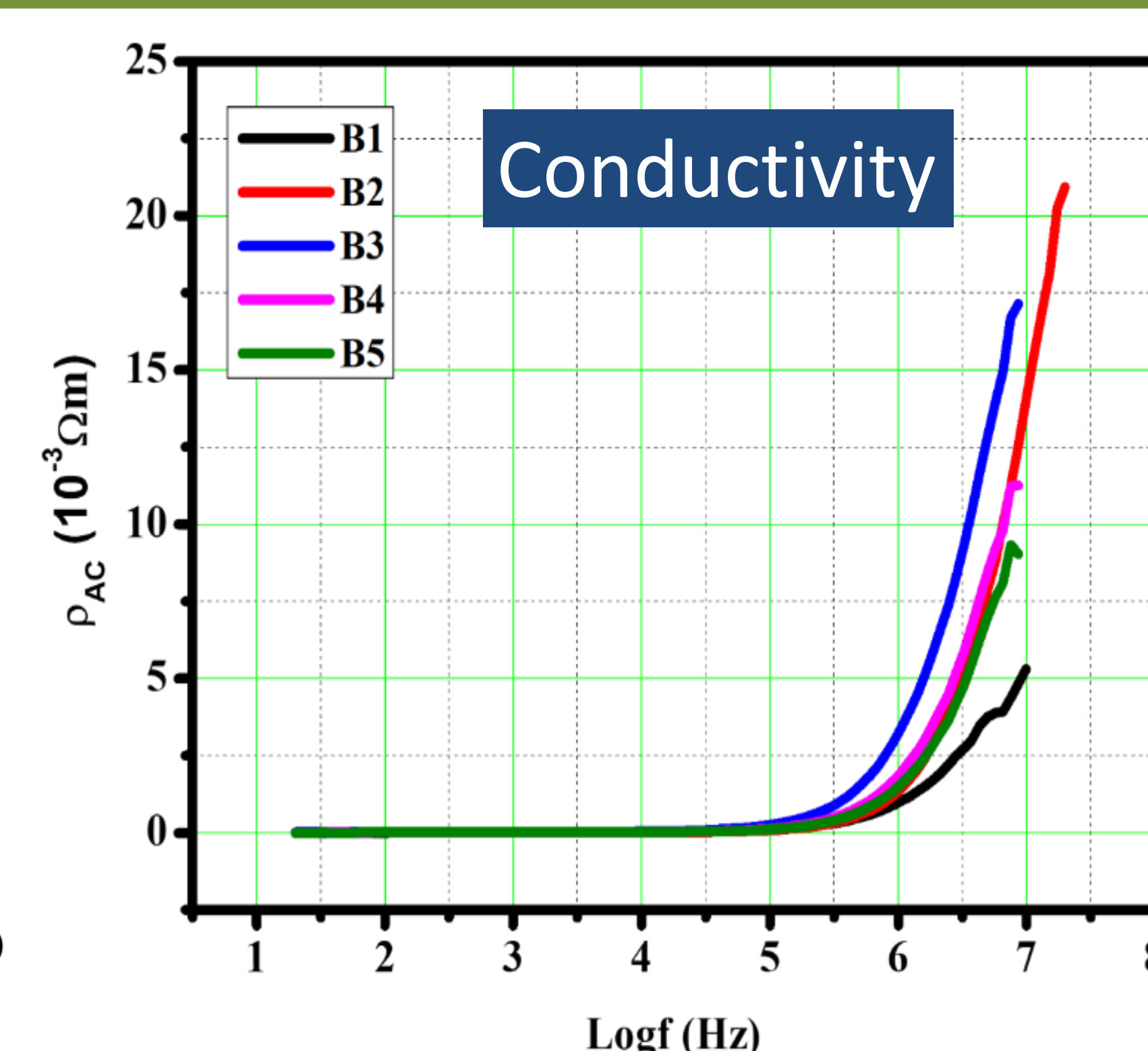
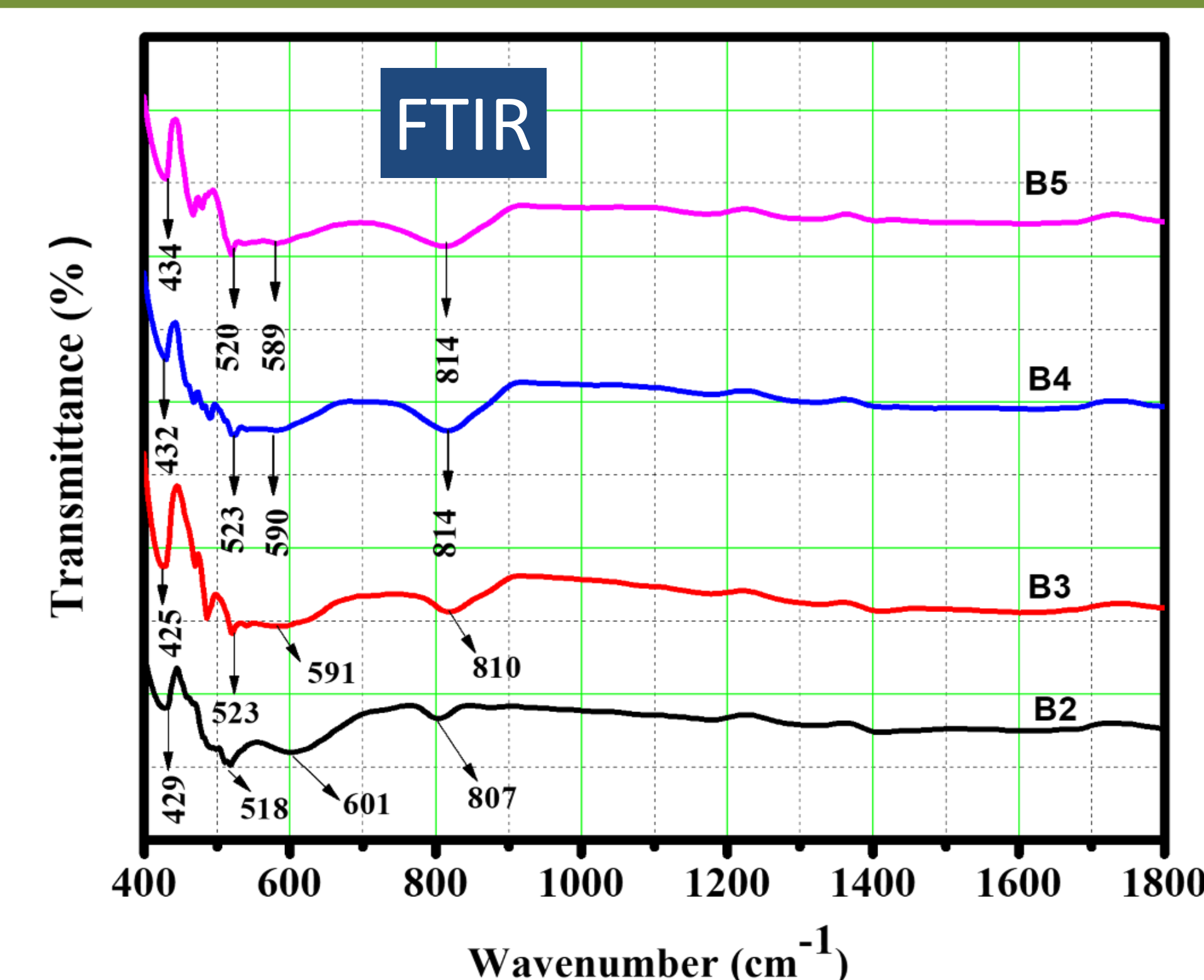
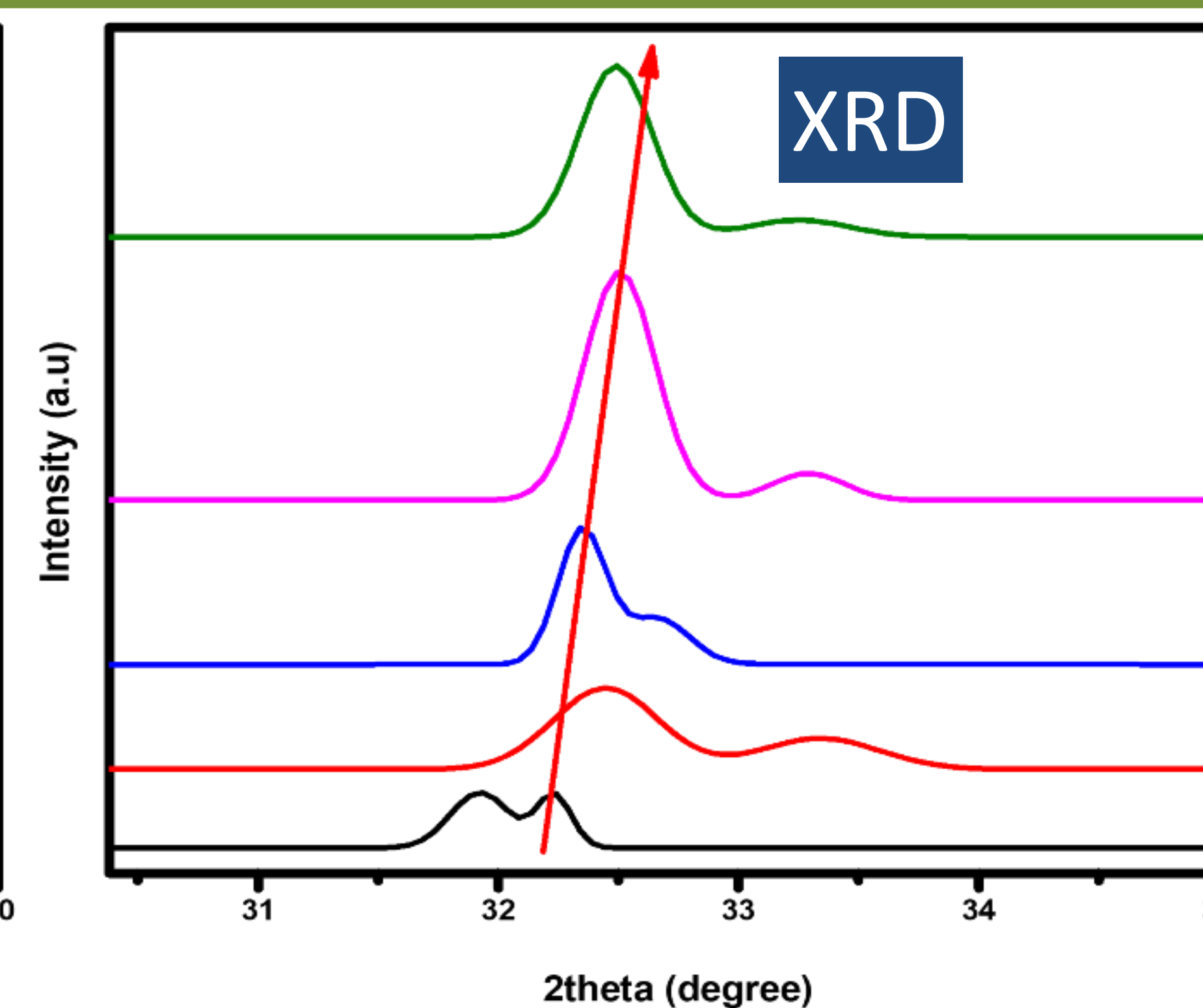
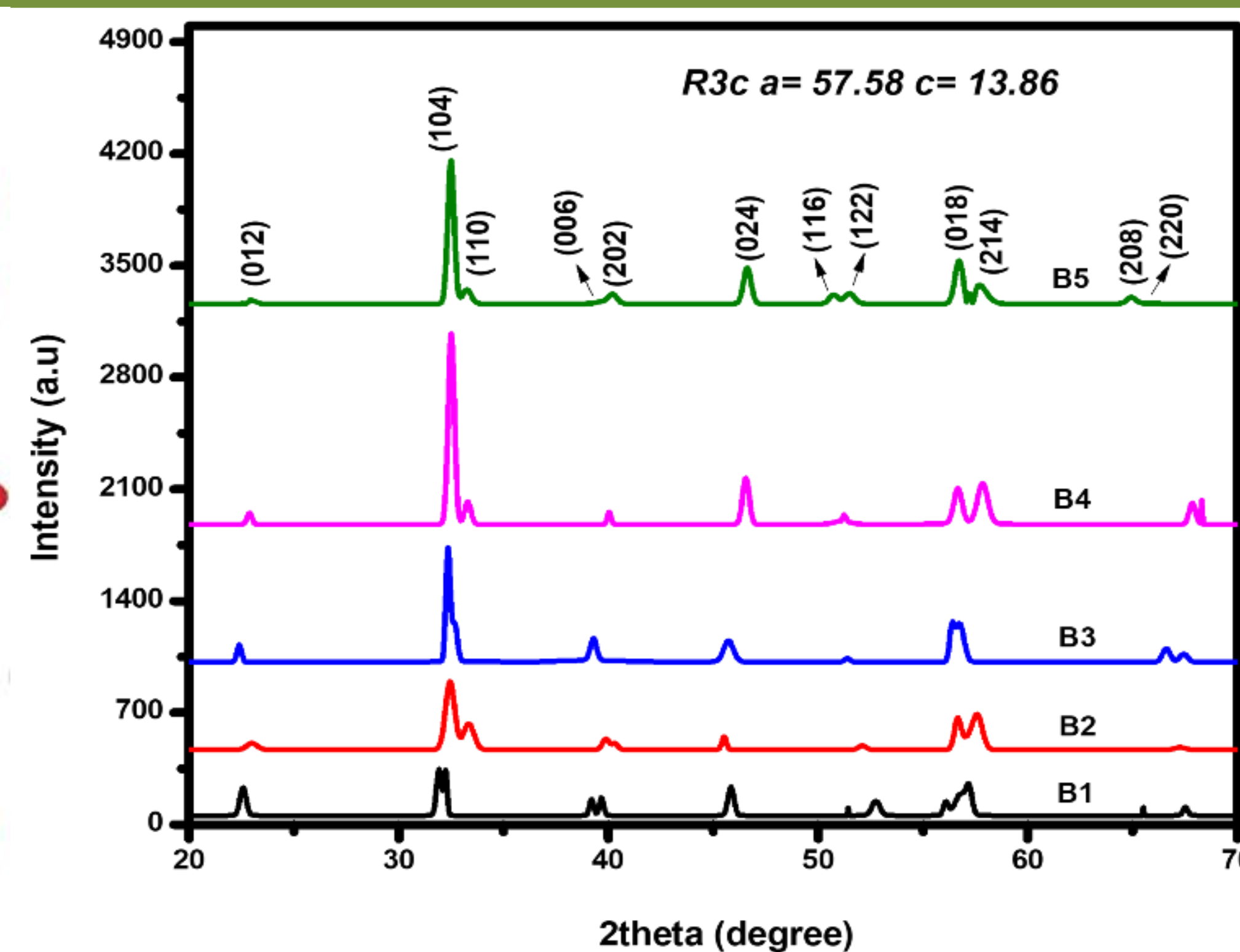
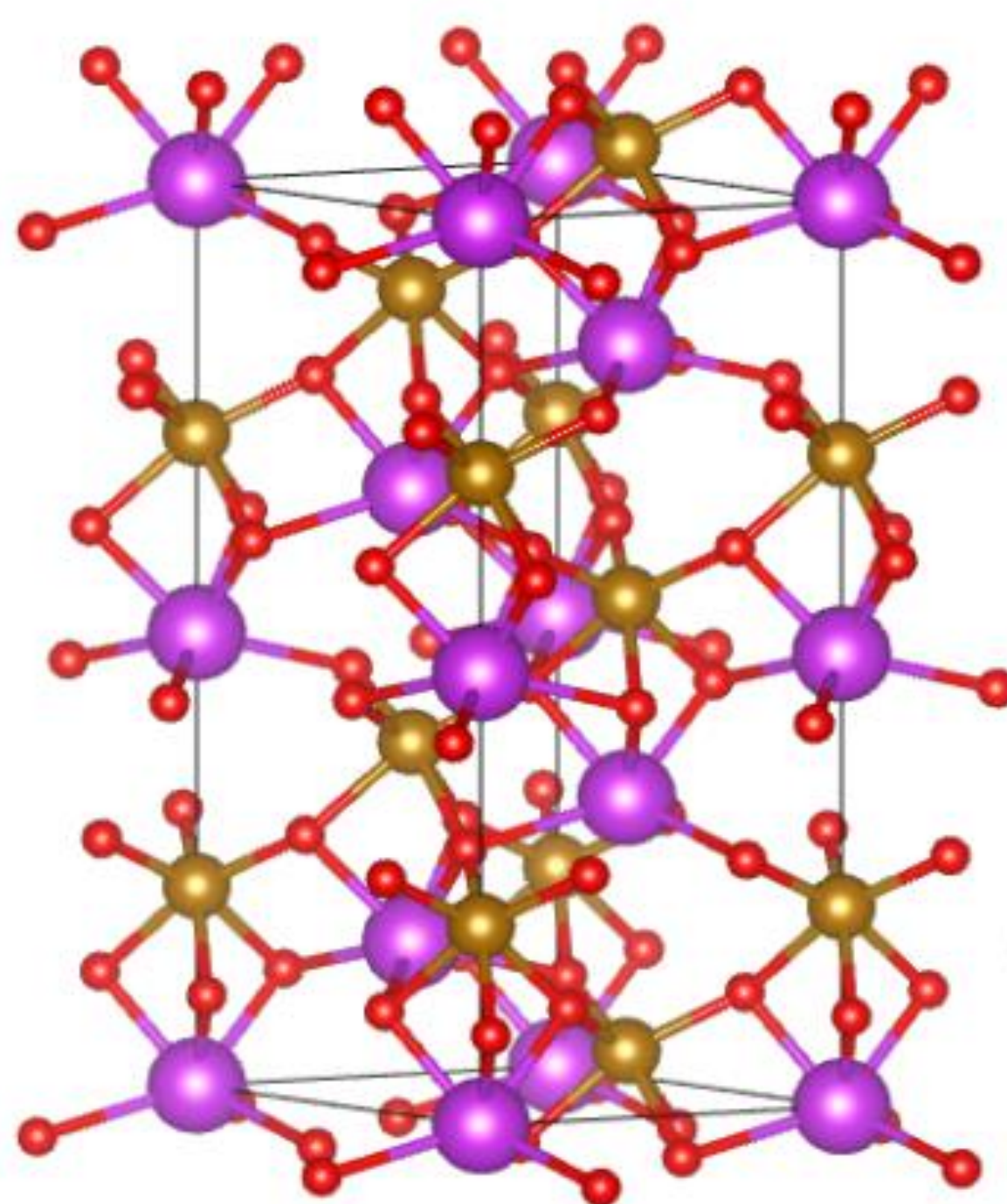
Issues

- Toxic
- Stability Issues
- Expensive

Why HEOs?

- Multifunctional
- High Stability
- Superior properties

Unit cell



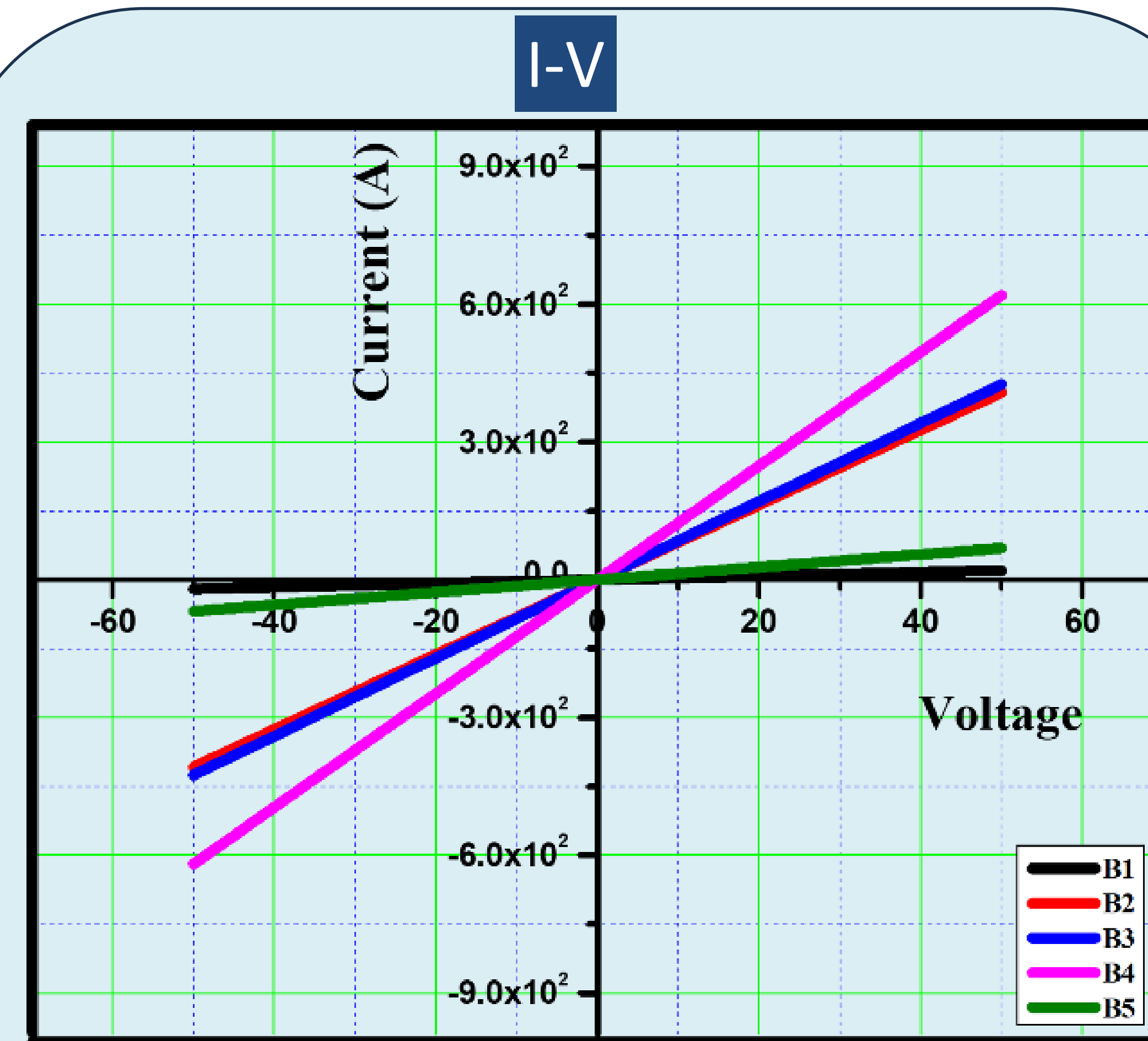
Sustainable Development Goals

Research on **high-entropy oxides (HEOs)** or **nanomaterials** for energy applications directly contributes to:

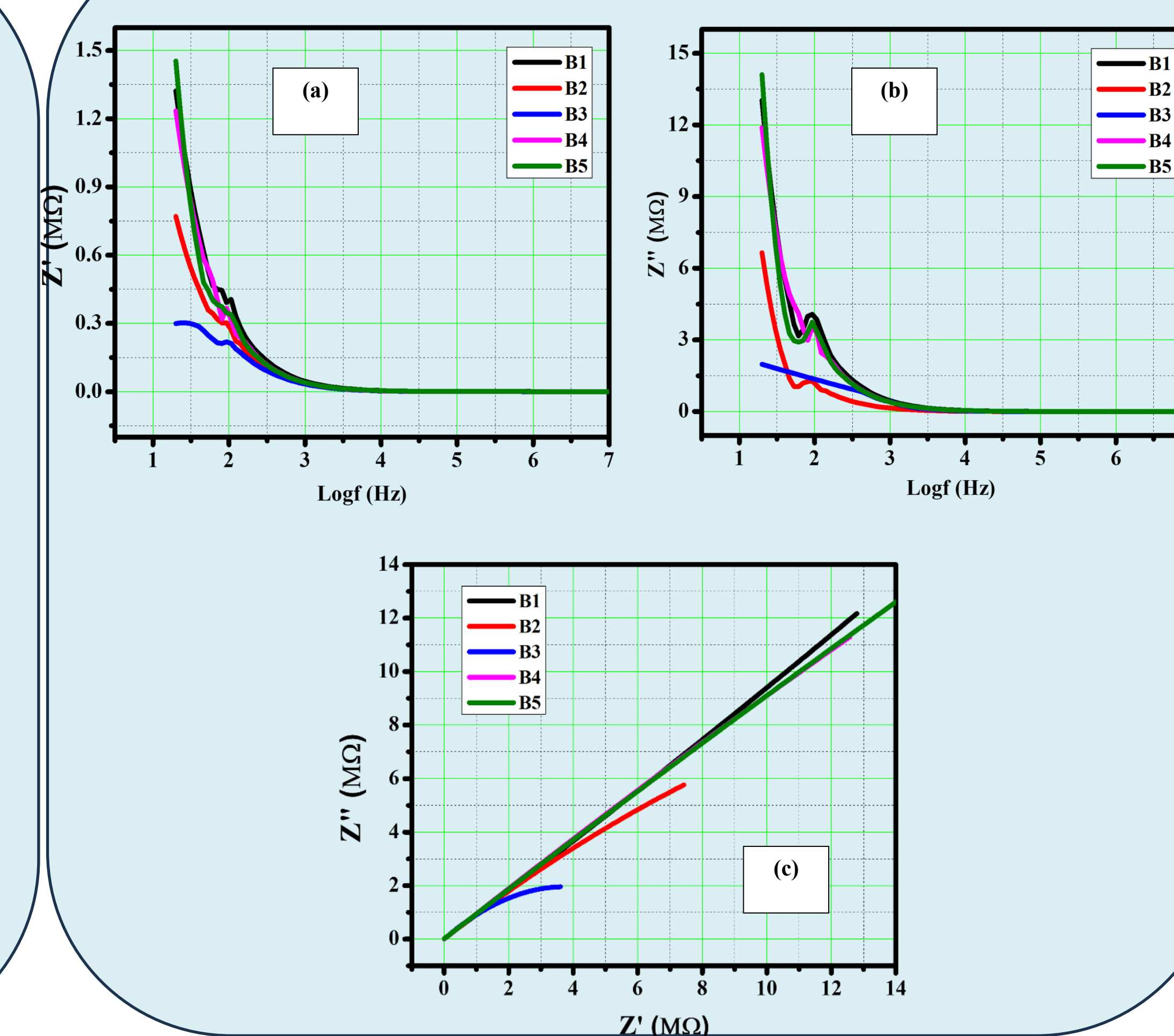
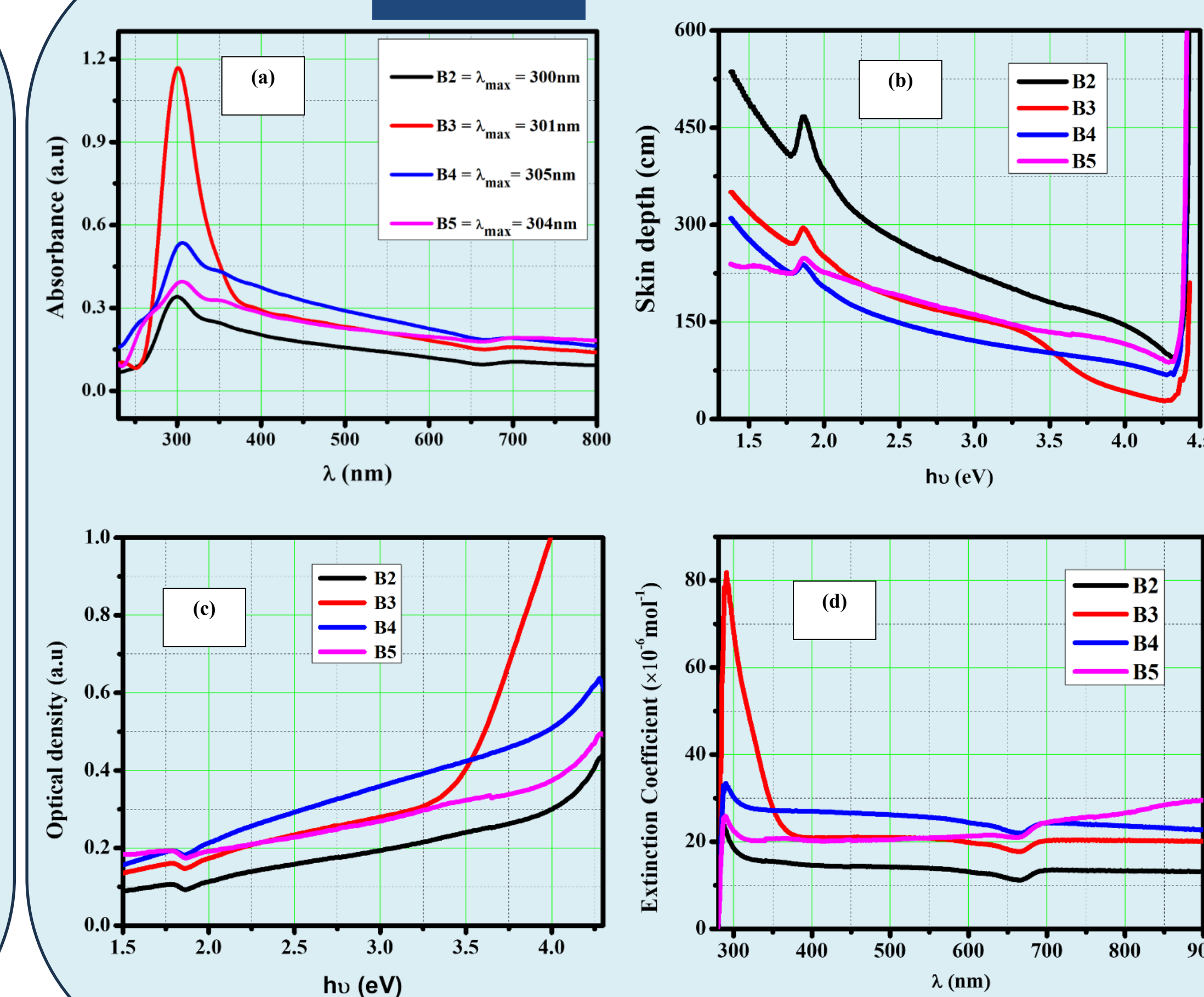
- SDG 7** (by enabling efficient photocatalysis, batteries, fuel cells, hydrogen production).
- SDG 9** (developing innovative energy materials).
- SDG 13** (climate mitigation through renewable energy and clean technologies)

Composition

Parent
BiFeO₃
A-site substitution
(Bi_{0.2}Ba_{0.2}Ca_{0.2}Sr_{0.2}Ce_{0.2})
B-site substitution
(Fe_{1-x}Mo_x)



UV-Vis



Conclusions

The study synthesized BiFeO₃-based high-entropy perovskite oxides with phase-pure structures, enhanced microstructure, and tunable optical and electrical properties. Mo doping improved crystallinity, reduced leakage current, and boosted dielectric and photocatalytic performance, highlighting their potential for advanced device applications.