**Universal Compositional Descriptors for Ionic Conductivity in Solid Electrolytes**

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Accurately predicting the ionic conductivity of inorganic solids solely from compositional information has been a challenge. Conventional compositional features often focus on elemental information while neglecting factors such as valence, polarizability, and size of ion. In this study, we developed a program that accurately determines the oxidation state of an element using its redox potential. With the assistance of this program, we crafted universal compositional descriptors rooted in the physical properties of ions. Employing regression learning for anion conductivity through a multi-layer perceptron and compositional descriptors, high accuracy was achieved (mean absolute error below 1.0 on the logarithmic scale). We will discuss the predictive precision for the conductivities of various ion species, such as lithium-ion, comparing them to other available compositional features.