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**Electronegativity Spectrum Maps: A computational combinatorial materials synthesis and search tool.** O. PAUL ISIKAKU-IRONKWE, The Center for Superconductivity Technologies[TCST], Abuja FCT, Nigeria — Using Pauling's electronegativity scale of the elements from 0.7 to 4.0 we build a matrix of possible binary combinations in increments of 0.1 for binary systems $A_xB_y$. We get a 34 x 34 spreadsheet of electronegativities. We call this an ElectroNegativity Spectrum Map [ENSMap]. Each of the 1156 cells represents a possible combination of two electronegativities that could yield a binary compound. Using the correlation between electronegativity and superconductivity, we can identify from an ENSMap the electronegativities of known superconductors of a given binary class. We can also identify other electronegativity combinations that give the same electronegativity as a known superconductor. Here we show that ENSMAPS of binary systems can become a powerful computational combinatorial material synthesis tool and also a tool for searching for novel materials. We use ENMaps to predict twenty new binary superconductors with high transition temperatures.

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