Electronegativity: A Mnemonic Rule

Electronegativity continues to be a most useful idea in chemistry. It helps, mainly, to "interpret" and/or predict the nature of the chemical bond by a mere difference of two numbers: the electronegativities of the atoms participating in the bond in question.

The purpose of the present note is to suggest a simple mnemonic rule for the electronegativities (E) of the second-(E_2) and third-(E_3) row elements. It is for these elements that application of the electronegativity idea is most successful.

$$E_2 = \frac{z-1}{2} \text{ and } E_3 = \frac{z^*-1}{3}$$

where z is the atomic number of the element, 2 and 3 correspond to the second- and third-row elements, respectively, and z^* is an effective atomic number, $z^* = z - 7$. Formula E_2 predicts "exactly" the electronegativities (in Pauling's scale) of all second-row elements. Values obtained from E_3 are consistently larger by 0.1 or 0.2 units for all third-row elements, except chlorine. For the latter, the exact Pauling number is reproduced.

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