

valence-shell-electron-pair repulsion (VSEPR) theory

A semiquantitative approach to the prediction of the geometries of compounds of main-group elements. The basic idea of the theory is that the geometric arrangement of the bonds around a central atom depends on the number of electron pairs in its valence shell. A given number of electron pairs adopt that arrangement which keeps them as far apart as possible, as a consequence of the operation of the Pauli exclusion principle. The arrangements of electron pairs are essentially retained independently of whether they are unshared pairs, or form single, double or triple bonds. The theory is concerned with the arrangement of predominantly covalent bonds around a single central atom. It does not apply to the compounds with ionic bonds and to molecules with multicenter bonds.

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