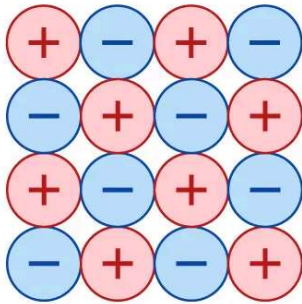


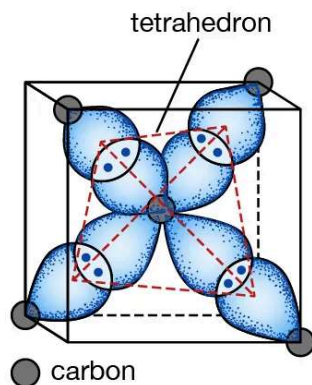
## Chemical bonding in crystalline solids

### ionic bond



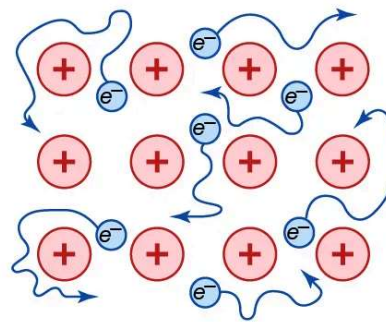
An idealized ionic (or electrovalent) bonding of oppositely charged ions.

### covalent bond



Covalent bonds involve electron sharing, such as between these carbon atoms when they form a diamond.

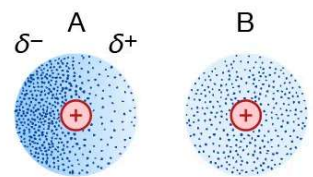
### metallic bond



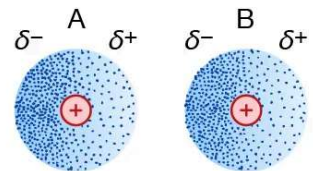
metallic structure, showing possible electron ( $e^-$ ) paths around the nuclei of metal atoms (represented as spheres with a positive charge)

Metallic bonding can be thought of as a cloud of positively charged ions immersed in a cloud of valence electrons.

### van der Waals bond



instantaneous dipole on A induces a dipole on B



weak dipole attraction of van der Waals bond

Neutral molecules may be held together by a weak electric force known as the van der Waals bond.

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