EngineeringRise

Tetravalency, hybridisation, classification and nomenclature

Formulas and units, JEE Main. Status: Reviewed on 2026-11-20.

Result	Formula	Units or note
Hybridisation rule	steric number = sigma bonds + lone pairs; 4 sp3, 3 sp2, 2 sp Valid when: carbon in organic molecules; localised sigma bonds and lone pairs	dimensionless count
Bond angles	sp3 109.5, sp2 120, sp 180 Valid when: ideal geometry; ring strain or lone pairs change the angles	degrees
s-character	sp3 25, sp2 33.3, sp 50 Valid when: hybrid orbital s-character, equal mixing	percent
Sigma and pi in bonds	single 1 sigma; double 1 sigma + 1 pi; triple 1 sigma + 2 pi	count
Alkane, alkene, alkyne	CnH2n+2, CnH2n, CnH2n-2 Valid when: open-chain hydrocarbons with one double bond or triple bond	dimensionless
Degrees of unsaturation	(2C + 2 + N - H - X) / 2 = rings + pi bonds Valid when: neutral compound of C, H, N, halogens; O ignored	count
Sigma bonds, acyclic molecule	number of atoms - 1 Valid when: acyclic molecule with only single sigma links counted per connection	count
Homologue gap	successive members differ by CH2 = 14 Valid when: members of one homologous series, same functional group	u (g per mol)
Principal group priority	acid > ester > acid halide > amide > nitrile > aldehyde > ketone > alcohol > amine; then lowest locant to C=C, then C?C	n/a (order)

Full lesson with worked examples:
https://www.engineeringrise.in/learn/learn/jee-main/chemistry/basic-principles-of-organic-chemistry/tetravalency-hybridisation-classi

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