

Problem 1

(a): (a): ~~sp^3 , trigonal pyramidal~~ sp^3 , trigonal pyramidal

(b): sp^2 , Bent

(c): sp^3 , Trigonal pyramidal

(d): All are sp^2 & trigonal planar.

Problem 2

(a) sp

(b) sp^3

(c) sp^2

(d) sp^2

Problem 3

(a) (a) sp^3

(b) sp^2

(c) sp^2

(b) There are 6 $\sigma(C2sp^3, H1s)$ bonds, 2 $\sigma(C2sp^3, C2sp^3)$, and 1 $\pi(C2p_x, O2p_x) + \sigma(C2sp^2, O2sp^2)$ bond.