CHEMISTRY 1ADV / SSP (CHEM1901/1903) June 2000

2000-J-2

- -1210 kJ mol^{-1}
- Electrons confined to the atomic orbital become delocalised over 2 atoms when bond forms. Their kinetic energy is thus lowered and is released as heat - exothermic reaction.
- H_2O would have the larger negative heats of solvation. The ion-dipole interactions that form on dissolution will be much greater for H_2O than for H_2Te as the former is a much more polar solvent.

  O is very electronegative. O is small atom. These features make H bonding possible in water (leading to high bp). Main intermolecular attraction in H_2Te is dispersion forces.

2000-J-3

- -238.6 kJ mol^{-1}
- Electrons can only exist in discrete energy levels. These correspond to the stable "standing wavefunctions.
- Delocalisation of electrons means that they are confined to a much larger region than normally. Therefore wavelength of their wavefunction increases and thus the kinetic energy will decrease.

2000-J-4

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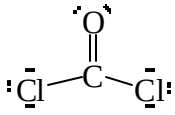	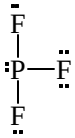	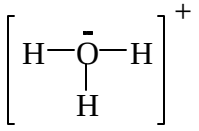
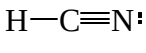	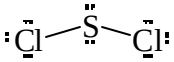	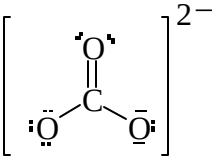

$COCl_2$	PF_3	H_3O^+	HCN	SCl_2	CO_3^{2-}
3	4	4	2	4	3
1	0	0	2	0	1
trigonal planar	tetrahedral	tetrahedral	linear	tetrahedral	trigonal planar
sp^2	sp^3	sp^3	sp	sp^3	sp^2
trigonal planar	trigonal pyramidal	trigonal pyramidal	linear	bent	trigonal planar
yes	yes		yes	yes	

2000-J-5

- 2.5 atm

  2.5 atm

ΔE	ΔH	ΔS	ΔG
0	0	+	–
+	+	+	+
+	+	+	0

2000-J-6

- 0.78
- 24.5 mL
- ✓ ✗ ✓ ✗

2000-J-7

- rate = $k[NO_2^-][I^-][H_3O^+]^2$

  6.5×10^{-3}

  $L^2\ mol^{-2}\ s^{-1}$

  5.6×10^{-4} s