Ammad Hassan

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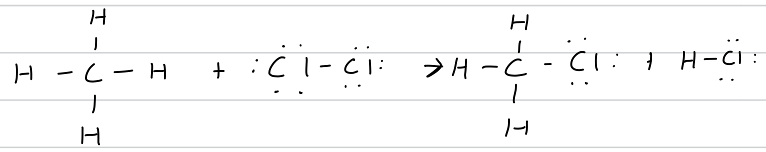
3rd Hour

1\.

C - 4
H_4 - 4
8



Cl_2 - 14

~~4(C-H)~~ + (Cl-Cl) - [(C-Cl) + ~~3(C-H)~~ + (H-Cl)]

C - 4
C - 7
H - 3
14

1(C-H) +

413 + 242 - [328 + 431] = -104 kJ/mol

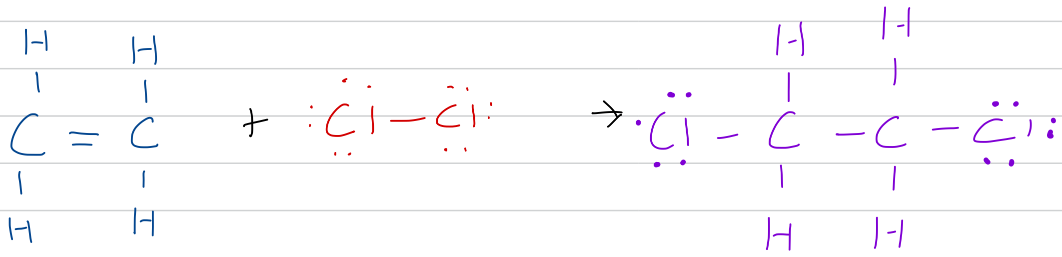
H - 1
Cl - 7
8

2\.
-148

$C_2H_4 + Cl_2 \rightarrow C_2H_4Cl_2$

C - 8
H - 4
12

Cl - 14
14



C - 8
H - 4
Cl - 14
26

~~4(C-H)~~ + (C=C) + (Cl-Cl) - [~~4(C-H)~~ + (C-C) + 2(C-Cl)]

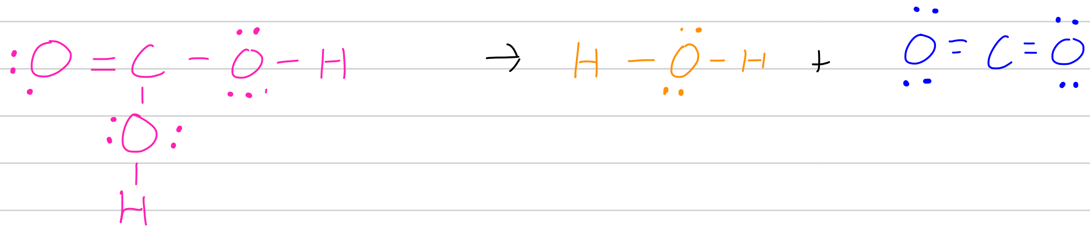
614 + 242 - (348 + 2(328)) = -148 kJ/mol

3\.
-83

Oxygen holds electrons well
Na - loses electron easily - Based on shielding not tight
Oxygen (2nd + electronegative)
Hydrogens
H ← O covalently bonded to Carbon - Hold electrons rather well Oxygen
extra electrons
Central Atom
> Period 3

$H_2CO_3 \rightarrow H_2O + CO_2$

Lone pairs lose electrons, can bounce - most likely



C - 4
O - 18
H - 2
24

O - 6
H - 2
8

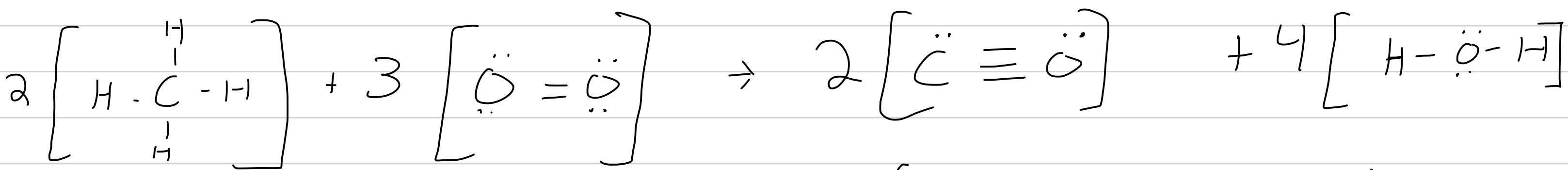
C - 4
O - 12
16

~~(C=O) + 2(C-O) + 2(O-H) - 2(O-H) - 2(C=O)~~

- (C=O) + 2(C-O) =
-799 + 2(358) = -83 kJ/mol

4\.
-1059

$2CH_4 + 3O_2 \rightarrow 2CO + 4H_2O$



C - 4
H - 4
8

O - 12

12

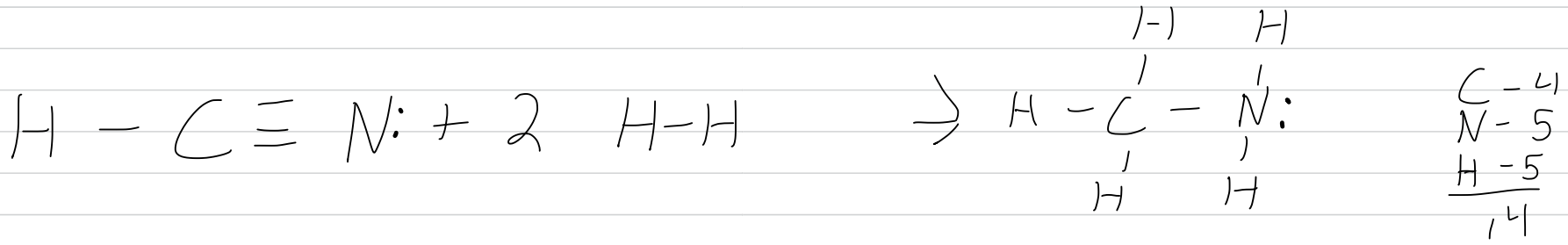
C - 4
O - 6
10

H - 2
O - 6
8

2(4(C-H)) 3(O=O) - [2(C≡O) + 4(2(O-H))]

8(C-H) + 3(O=O) - [2(C≡O) + 8(O-H)] = 8(413) + 3(495) - 2(1072) - 8(463) = -1059 kJ/mol

5. $HCN + 2H_2 \rightarrow CH_3NH_2$



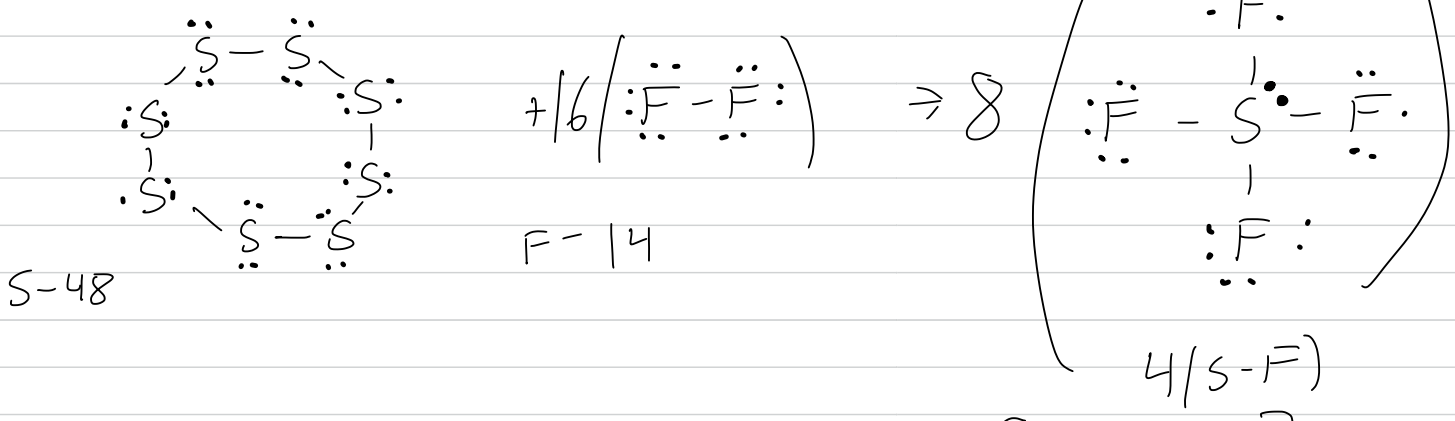
C - 4
N - 5
H - 1
10

$(H-C) + (C \equiv N) + 2(H-H) - [(C-N) + 2(N-H) + 3(C-H)]$

$-2(H-C) + 2(H-H) + (C \equiv N) - (C-N) - 2(N-H)$

$-2(413) + 2(436) + (891) - (293) - 2(391) = -138$ kJ/mol

6. $S_8 + 16\,F_2 \rightarrow 8\,SF_4$



S - 48

S - 6
F - 28
34

$8(S-S) + 16(F-F) - [32(S-F)]$

$8(266) + 16(155) - 32(327) = -5856$ kJ/mol