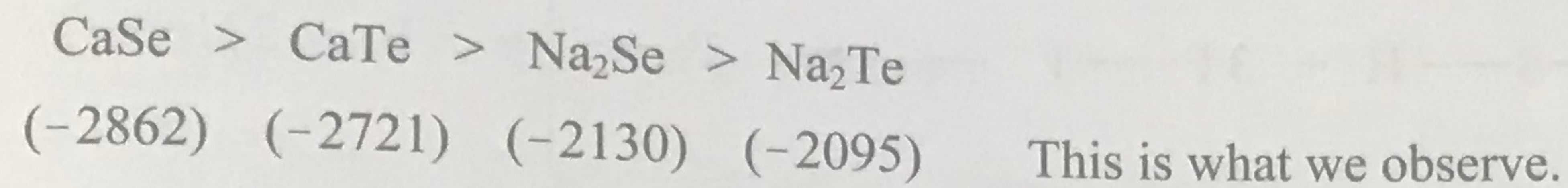
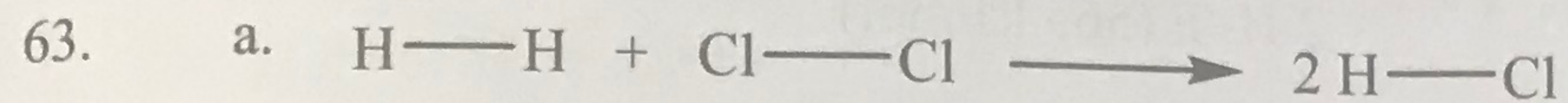


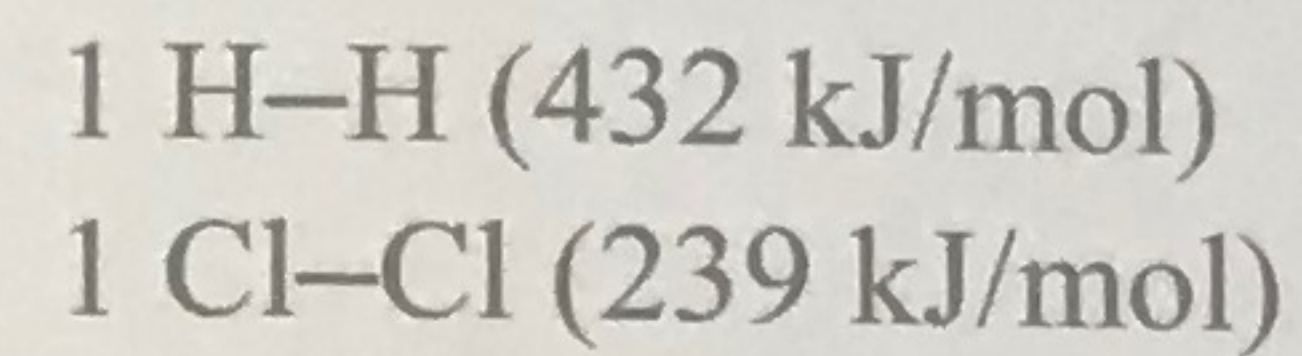
61. Ca^{2+} has a greater charge than Na^+ , and Se^{2-} is smaller than Te^{2-} . The effect of charge on the lattice energy is greater than the effect of size. We expect the trend from most exothermic to least exothermic to be:



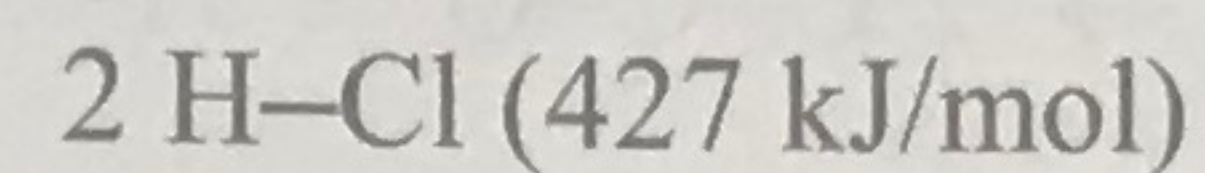
Bond Energies



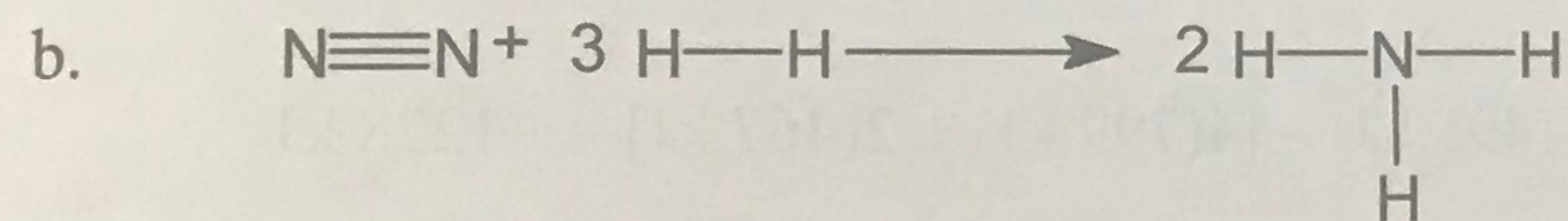
Bonds broken:



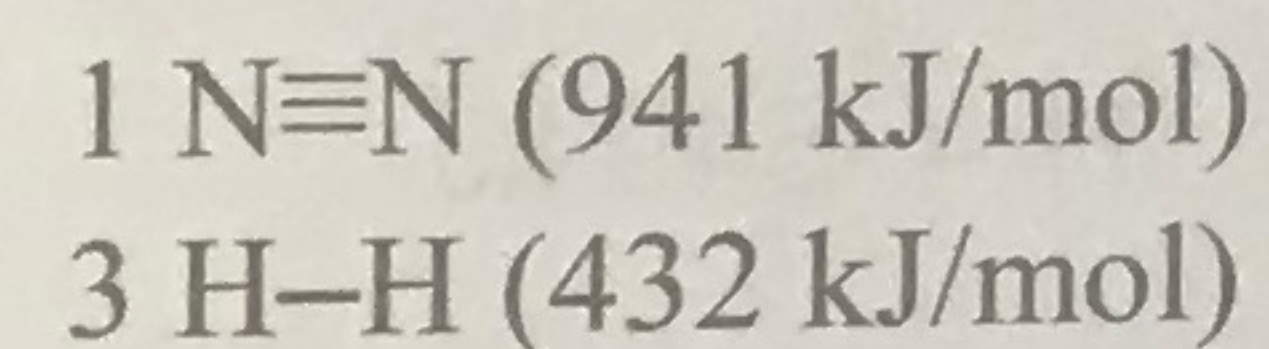
Bonds formed:



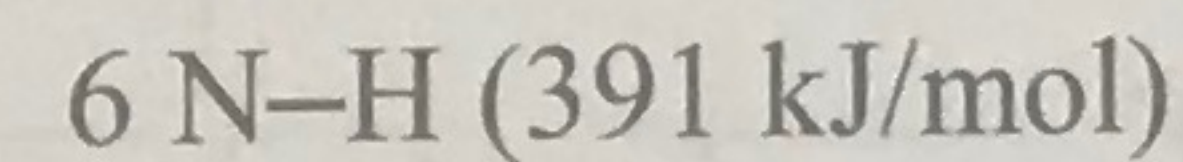
$$\Delta H = \Sigma D_{\text{broken}} - \Sigma D_{\text{formed}}, \quad \Delta H = 432 \text{ kJ} + 239 \text{ kJ} - 2(427) \text{ kJ} = -183 \text{ kJ}$$



Bonds broken:

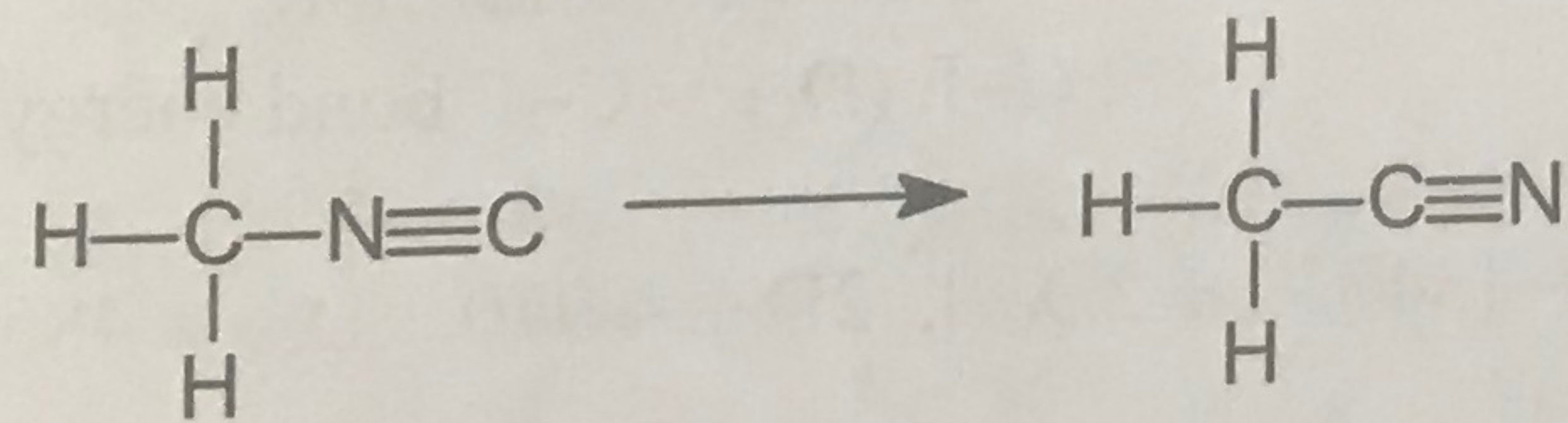


Bonds formed:



$$\Delta H = 941 \text{ kJ} + 3(432) \text{ kJ} - 6(391) \text{ kJ} = -109 \text{ kJ}$$

65.



Bonds broken: 1 C-N (305 kJ/mol) Bonds formed: 1 C-C (347 kJ/mol)

$$\Delta H = \Sigma D_{\text{broken}} - \Sigma D_{\text{formed}}, \quad \Delta H = 305 - 347 = -42 \text{ kJ}$$

Note: Sometimes some of the bonds remain the same between reactants and products. To save time, only break and form bonds that are involved in the reaction.