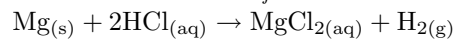


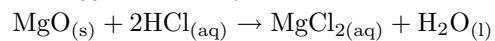
Valikvõistlus. Test

(7. aprill 2004. a)

1. Vee tekkeentalpia väärtus on -286 kJ/mol. Kasutades allpool toodud informatsiooni, leidke ΔH_f° MgO jaoks



$$\Delta_r H_{298}^\circ = -467 \text{ kJ/mol}$$



$$\Delta_r H_{298}^\circ = -151 \text{ kJ/mol}$$

(A) -904 kJ/mol

(B) -602 kJ/mol

(C) -334 kJ/mol

(D) -30 kJ/mol

2. Leidke NaCl kristallvõre energia (ΔH_L). Vahim kaugus (r) Na^+ ja Cl^- ionide vahel on 2.814 \AA , koefitsent n on võrdne 9, Madelungi konstant (A) on 1.75. Born-Landé võrrand on:

$$\Delta H_L = -1389 \frac{Az^+z^-}{r} \left(1 - \frac{1}{n}\right)$$

(A) -768 kJ/mol

(B) -682 kJ/mol

(C) -439 kJ/mol

(D) -752 kJ/mol

3. AgCl kristalli struktuur on identne NaCl struktuuriga. Sellest järeldub, et Madelungi konstant AgCl jaoks on

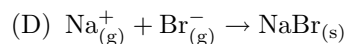
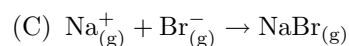
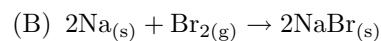
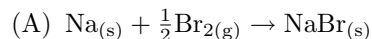
(A) ≈ 1.75

(B) ≈ 0.69

(C) ≈ 2.40

(D) ≈ 1.64

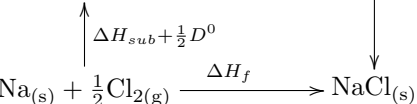
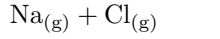
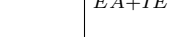
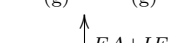
4. Naatriumbromiidi standardne tekkeentalpia (ΔH_f°) on võrdne järgmise reaktsiooni entalpiaga



5. Kasutades teises küsimuses saadud ΔH_L väärtust ja allpool toodud väärtusi (kJ/mol, leidke NaCl tekkeentalpia (ΔH_f)

$$D^0 = 242 \qquad \Delta H_{sub} = 108$$

$$EA = -355 \qquad IE = 495$$



(A) -399 kJ/mol

(B) -682 kJ/mol

(C) -450 kJ/mol

(D) -278 kJ/mol

6. Kasutades allpool toodud väärtusi, leidke KCl kristallvõre energia (ΔH_L) KCl

$$\Delta H_f(\text{KCl}) = -438 \text{ kJ/mol}$$

$$\Delta H_{sub}(\text{K}) = 90 \text{ kJ/mol}$$

$$IE(\text{K}) = 425 \text{ kJ/mol}$$

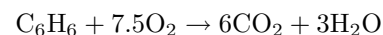
(A) -719 kJ/mol

(B) -667 kJ/mol

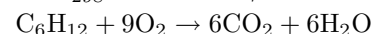
(C) -840 kJ/mol

(D) -55 kJ/mol

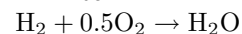
7. Kasutades Hessi seadust, leidke reaktsiooni $\text{C}_6\text{H}_6 + 3\text{H}_2 \rightarrow \text{C}_6\text{H}_{12}$ energia



$$\Delta_r H_{298}^\circ = -3268 \text{ kJ/mol}$$



$$\Delta_r H_{298}^\circ = -3920 \text{ kJ/mol}$$



$$\Delta_r H_{298}^\circ = -289 \text{ kJ/mol}$$

(A) -215 kJ/mol

(B) -430 kJ/mol

(C) -230 kJ/mol

(D) -30 kJ/mol

8. Kasutades andmeid sidemeenergiate kohta (kJ/mol), leidke $\Delta_r H^\circ$ reaktsiooni $\text{H}_2(g) + \text{O}_2(g) \rightarrow \text{H}_2\text{O}_{2(l)}$ jaoks

$$E_{\text{H-H}} = 432$$

$$E_{\text{H-O}} = 459$$

$$E_{\text{O-O}} = 207$$

$$E_{\text{O=O}} = 494$$

(A) -199 kJ/mol

(B) -521 kJ/mol

(C) -486 kJ/mol

(D) $+199$ kJ/mol

9. Milline väide on õige?

(1) ionide laeng

(2) ionide raadius

(3) kristalliline struktuur

Ioonse kristallvõre energia sõltub

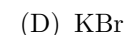
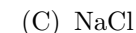
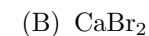
(A) nii tingimusest (1), (2) kui (3)

(B) ainult tingimusest (2) ja (3)

(C) ainult tingimusest (1) ja (2)

(D) ainult tingimusest (1)

10. Born-Landé võrrandi (vt küsimus 2) alusel määrake, milline kristallidest omab kõige suuremat võreenergiat ΔH_L



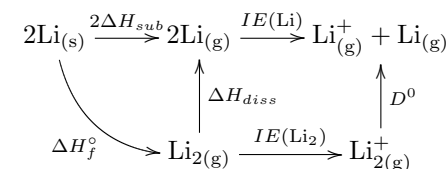
11. Määrake diliitiumi (Li_2) tekkeentalpia väärtus antud reaktsiooni järgi: $2\text{Li}_{(s)} \rightarrow \text{Li}_{2(g)}$

$$\Delta D^0(\text{Li}_2^+) = 129.8 \text{ kJ/mol}$$

$$IE(\text{Li}_2) = 493.3 \text{ kJ/mol}$$

$$IE(\text{Li}) = 520.3 \text{ kJ/mol}$$

$$\Delta H_{sub}(\text{Li}_s) = 159.4 \text{ kJ/mol}$$



(A) 216.0 kJ/mol

(B) 102.9 kJ/mol

(C) 29.6 kJ/mol

(D) 56.6 kJ/mol

12. Milline on $\Delta_r H^\circ$ reaktsiooni $2\text{FeO}_{(s)} + 0.5\text{O}_{2(g)} \rightarrow \text{Fe}_2\text{O}_{3(s)}$ jaoks

$$\Delta H_f^\circ(\text{Fe}_2\text{O}_{3(s)}) = -822 \text{ kJ/mol}$$

$$\Delta H_f^\circ(\text{FeO}_{(s)}) = -265 \text{ kJ/mol}$$

(A) -292 kJ

(B) 286 kJ

(C) 859 kJ

(D) -536 kJ