Assignment 6_Chemistry of main group elements

The due date for submitting this assignment has passed. Due on 2018-03-07, 23:59 IST.

Submitted assignment

1) Treatment of boron halide with either LiAlH₄ or LiBH₄ yields diborane, B₂H₆. This method involves a process known as.................

- transmetallation
- β-hydrogen elimination
- metathesis
- hydrometallation

No, the answer is incorrect.
Score: 0
Accepted Answers: metathesis

2) Both LiBH₄ and LiAlH₄, like LiH, are good reagents for the transfer of H⁺, but they are generally preferred over LiH and NaH because

- they are insoluble in ethers
- they are soluble in ethers
- they are more basic than LiH and NaH
- they are more acidic than LiH and NaH

No, the answer is incorrect.
Score: 0
Accepted Answers: they are soluble in ethers

3) Reaction of diborane with NaBH₄ yields

1 point
4) In concentrated NaOH solution and in the presence of Ba(OH)$_2$, the hydrated oxide Tl$_2$O$_3$·xH$_2$O forms $X$, and in solid state, it shows a structure that is related to that of $Y$. $X$ and $Y$ are

- $X = \text{Ba}[\text{Tl(OH)}_4]\text{OH}$ and $Y = \text{MgAl}_2\text{O}_4$
- $X = \text{Ba}_2[\text{Tl(OH)}_6]\text{OH}$ and $Y = \text{BaTiO}_3$
- $X = \text{Ba}_2[\text{Tl(OH)}_6]\text{OH}$ and $Y = \text{K}_2\text{PtCl}_6$
- $X = \text{Ba}[\text{Tl(OH)}_5]$ and $Y = \text{BeAl}_2\text{O}_4$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$X = \text{Ba}_2[\text{Tl(OH)}_6]\text{OH}$ and $Y = \text{K}_2\text{PtCl}_6$

5) The structure of AlCl$_3$ in the solid state is

- dimeric form with only dative bonds between Al and Cl in the bridging unit
- six coordinate Al centers with chloride bridges
- dimeric form with covalent bonds between Al and Cl in the bridging unit
- six coordinate Al centers with chloride bridges only in the square plane

No, the answer is incorrect.
Score: 0
Accepted Answers:
six coordinate Al centers with chloride bridges

6) BF$_3$ reacts with NH$_3$ to give $X$, whereas BCl$_3$ reacts with liquid NH$_3$ to give $Y$. $X$ and $Y$ are

- $X = \text{BF}_3\cdot\text{NH}_3$; $Y = \text{BCl}_3\cdot\text{NH}_3$
- $X = (\text{BN})_x$; $Y = \text{B}_3\text{N}_3\text{Cl}_3$
- $X = \text{BF}_3\cdot\text{NH}_3$; $Y = (\text{BN})_x$
- $X = \text{BF}_3\cdot\text{NH}_3$; $Y = \text{B(NH}_2)_3$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$X = \text{BF}_3\cdot\text{NH}_3$; $Y = \text{B(NH}_2)_3$

7) Cryolite, Na$_3$[AlF$_6$] occurs naturally but is also synthesized to meet commercial needs. The starting materials for the synthesis of cryolite are

- AlCl$_3$, (NH$_4$)$_2$HF and NaOH
- Al$_2$O$_3$, HF and Na$_2$SO$_4$
- Al(OH)$_3$, HF and NaOH
- Al(OH)$_3$, (NH$_4$)$_2$HF and Na$_2$SO$_4$

No, the answer is incorrect.
8) BCl₃ on treatment with Hg gives

- B₈Cl₈ and Hg₂Cl₂
- B₉Cl₉ and HgCl₂
- B₂Cl₄ and Hg₂Cl₂
- B₂Cl₄ and HgCl₂

No, the answer is incorrect.

Score: 0

Accepted Answers:
- Al(OH)₃, HF and NaOH

9) Borazine, B₃N₃H₆, on treatment with 3 equivalents of water gives

- B(OH)₃ and H₂
- [B(OH)NH]₃ and H₂
- [B(OH)NH]₃ and NH₃
- B(OH)₃; NH₃ and H₂

No, the answer is incorrect.

Score: 0

Accepted Answers:
- B₂Cl₄ and HgCl₂

10) The reaction of Ga metal with NH₄F at 620 K liberates H₂ and NH₃ and yields X in which gallium is in +3 oxidation state. The solid state structure of X consists of discrete cations lying between sheets composed of vertex-sharing octahedral. X is

- Ga₂F₆
- Ga[GaF₄]
- (NH₄)₃[GaF₆]
- GaF₃

No, the answer is incorrect.

Score: 0

Accepted Answers:
- (NH₄)₃[GaF₆]