12th grade answers

1)

Metallic: $Hg; Li$.
Covalent polar: $HBr; CO; H_2O$
Ionic: $NaCl$
Covalent non-polar: I_2

Ionic between $Cs-O$, covalent polar between $O-H$.
Covalent polar between both $Fe-O$ and $O-H$.

In helium there are only intermolecular forces.

Electron configurations:
$Cl^- \left| 1s^2 2s^2 2p^6 3s^2 3p^6 \right.$
$Na^+ \left| 1s^2 2s^2 2p^6 \right.$

2)

a) $2HNO_2 + H_2S \rightarrow S + 2NO + 2H_2O$
b) $3C + 4HNO_3 \rightarrow 3CO_2 + 4NO + 2H_2O$
c) $I_2 + 5Cl_2 + 6H_2O \rightarrow 2HIO_3 + 10HCl$
d) $2KMnO_4 + 16HCl \rightarrow 2KCl + 2MnCl_2 + 5Cl_2 + 8H_2O$
e) $8Al + 30HNO_3 \rightarrow 8Al(NO_3)_3 + 3NH_4NO_3 + 9H_2O$

Electron configurations:
$Mn \left| 1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^5 \right.$
$Al \left| 1s^2 2s^2 2p^6 3s^2 3p^1 \right.$

3)

a) BO

n(B) = n(O) $\frac{80,25}{M(B)} \Leftrightarrow \frac{19,75}{16} \rightarrow M(B) = 65g/mol = M(Zn)$

A = ZnO

b) i)

$ZnO + 2HNO_3 \rightarrow Zn(NO_3)_2 + H_2O$
$Zn(NO_3) + 2NaOH \rightarrow Zn(OH)_2 \downarrow + 2NaNO_3$

$n(ZnO) \Leftrightarrow n[Zn(NO_3)_2] \Leftrightarrow n[(Zn(OH)_2]$

$m[Zn(OH)_2] = 495g \quad M(ZnO) = 81g/mol$

$$m_{tegelik}(ZnO) = \frac{495}{99} * \frac{100}{75} * \frac{100}{85} * \frac{110}{100} * 81 = 699g$$

ii)

$Zn : X \Leftrightarrow 1:2$

$$\frac{47,79}{65} : \frac{52,21}{2 * M(X)} \Leftrightarrow 1:2 \Rightarrow M(X) = \frac{52,21 * 65}{47,79 * 2} = 35,5 = M(Cl)$$

G = $ZnCl_2$

F = Cl_2

$M(ZnCl_2) = 136g/mol$

$2ZnS + 3O_2 \rightarrow 2ZnO + 2SO_2 \uparrow$

$ZnO + H_2 \rightarrow Zn + H_2O$

$Zn + Cl_2 \rightarrow ZnCl_2$

$ZnCl_2 + 2NaOH \rightarrow Zn(OH)_2 + 2NaCl$

$n(ZnS) \Leftrightarrow n(ZnO) \Leftrightarrow n(Zn) \Leftrightarrow n(ZnCl_2) \Leftrightarrow n[Zn(OH)_2]$

$$m_{tegelik}(ZnS) = \frac{495}{99} * \frac{100}{75} * \frac{100}{92} * \frac{105}{100} * \frac{100}{78} * 97 = 946g$$

iii)

ZnO will cost 6*33=198$

ZnS will cost 5*45=225$

198<225

c)

A = ZnO, zinc oxide

B = Zn, zinc

C = $Zn(NO_3)_2$, zinc nitrate

D = $Zn(OH)_2$, zinc hydroxide

E = ZnS, zinc sulphide

F = Cl_2, chlorine

G = $ZnCl_2$, zinc chloride

d)

$ZnO + CO \rightarrow Zn + CO_2 \uparrow$

$3Zn + 8HNO_3(lahj.) \rightarrow 3Zn(NO_3)_2 + 2NO \uparrow + 4H_2O$

$Zn(NO_3)_2 + 2NaOH \rightarrow Zn(OH)_2 \downarrow + 2NaNO_3$