4 mol gas　　　　　　　6 mol gas

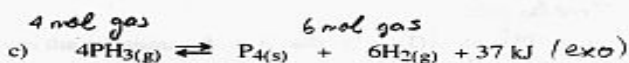c)　　$4PH_{3(g)} \rightleftharpoons P_{4(s)} + 6H_{2(g)} + 37$ kJ　(exo)

The　__products__　has/have minimum enthalpy.

The　__products__　has/have maximum entropy.

If $PH_{3(g)}$ was put in a flask, what should happen?(go to completion/ reach a state of equilibrium/not occur at all)

__go to completion__

20. Do systems always reach *minimum enthalpy* at equilibrium?　__no__

Explain. __the tendency for max. entropy may be opposing it__

21. Do systems always reach *maximum entropy* at equilibrium?　__no__

Explain. __the tendency for min. enthalpy may be opposing it__

22. A "heat term" in a chemical equation shows what is happening to the __enthalpy__

and really has nothing to do with the __entropy__.
(Answers are either entropy or enthalpy)

23. As a reaction approaches equilibrium, the rate of the forward reaction __decreases__.

while the rate of the reverse reaction __increases__.

Once equilibrium is reached, the rates become __equal__

24. Consider the reaction:　$BaCO_{3(s)} + heat \rightleftharpoons BaO_{(s)} + CO_{2(g)}$

Which one of the following observations will indicate that the reaction has most likely achieved *equilibrium*?

a) The mass of the system becomes constant (always true "cons. of mass")
b) The concentration of $BaO_{(s)}$ becomes constant (conc. of solids are always constant)
c) All the $BaCO_3$ is consumed. (doesn't go to completion)
d) The gas pressure of the system becomes constant

Your answer is __(d)__. Explain why. __pressure is a macroscopic property - becomes constant at equilibrium.__

25. Consider the following reaction:　$Fe^{3+}_{(aq)} + SCN^-_{(aq)} \rightleftharpoons FeSCN^{2+}_{(aq)}$

A solution of $Fe(NO_3)_3$ is added to a solution of KSCN. As equilibrium is being established,

the $[Fe^{3+}]$ is __decreasing__ and the $[FeSCN^{2+}]$ __increasing__

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