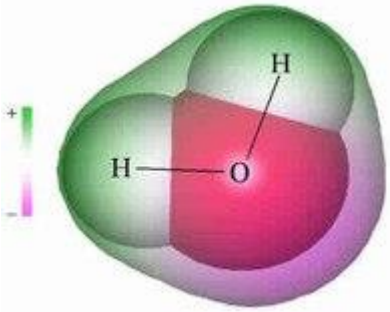
1. What is the molarity of a solution made by diluting 26.5 mL of 6.00M HNO_3 to a volume of 250 mL?
將 26.5 mL 的 6.00M HNO_3 稀釋至 250 mL 體積製成的溶液的摩爾濃度是多少？
A. 15.9 M
B. 0.636 M
C. 0.642 M
D. 1.59 M

2. What is it about the water molecule that makes it a great solvent?
是什麼讓水分子成為一種很好的溶劑？



A.water demonstrates polarity; a partial charge on each side of the molecule 水表現出極性; 分子每一側的部分電荷
B.due to its molecular formula 由於其分子式
C.it has a liner molecular shape 它具有線性分子形狀
D.due to it's non-polar molecular structure 由於其非極性分子結構

3. Kool-Aid - Powder, sugar, and water Identify the solvent
Kool-Aid - 粉末、糖和水 識別溶劑
A.water 水
B.powder 粉末
C.sugar 糖
D.powder and sugar 粉末和糖

4. Which of the following could contain a triple bond?
以下哪項可以包含三鍵？
A.C_4H_{10}
B.C_4H_8
C.C_4H_6
D.C_4H_{12}

5. How many σ and π bonds are present in …….
…….中存在多少 σ 和 π 鍵。
A.9σ, 4π
B.12σ, 6π
C.10σ,3π
D.12σ, 2π

6. The fragrance of flowers is due to the presence of some steam volatile organic compounds called essential oils. These are generally insoluble in water at room temperature but are miscible with water vapour in vapour phase. A suitable method for the extraction of oils from the flower is
花的香味是由於存在一些稱為精油的蒸汽揮發性有機化合物。 它們在室溫下通常不溶於水，但在氣相中可與水蒸氣混溶。 從花中提取油的合適方法是

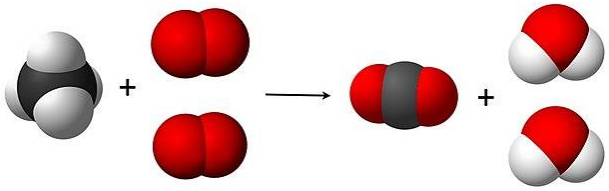
A.distillation 蒸餾
B.distillation under reduced pressure 減壓蒸餾
C.steam distillation 蒸汽蒸餾
D.crystallization 結晶

7. Reduction is the _____ of electrons.
還原是電子的_____
A.loss 損失
B.gain 增益
C.transfer 轉讓
D.share 分享

8. What is the oxidation number on the nitrogen in Mg_3N_2?
Mg_3N_2 中氮的氧化數是多少？
A.0
B.-2
C.-3
D.+3

9. Which element was reduced in the reaction below?
在下面的反應中減少了哪種元素？
Na + PbCl2 → Pb + NaCl
A.Na
B.Pb
C.Cl
D.No element was reduced 沒有元素減少

10. What are the products of a combustion reaction?
燃燒反應的產物是什麼？



A.a single complex compound 單一複合物
B.several simpler elements 一些更簡單的元素
C.carbon dioxide and water 二氧化碳和水
D.carbon dioxide and hydrogen 二氧化碳和氫氣

11. Which of the foll phenomena occur when a small amount of acid is added to water? 在水中加入少量酸時，會出現哪些現象？

A.ionisation 電離
B.neutralisation 中和
C.dilution 稀釋
D.formation 形成

12.For the reaction...
對於反應...
$N_2(g) + 3H_2(g) <-> 2NH_3(g)$

If the pressure in the system is increased, which substance will increase in concentration?
如果系統中的壓力增加，哪種物質的濃度會增加？

A.N_2
B.H_2
C.N_2 and H_2
D.NH_3

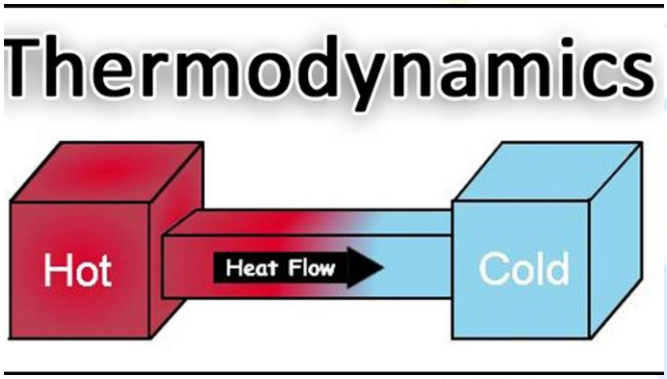
13. At ____ opposing processes occur at the same time and the same rate.
在____時，相反的過程同時以相同的速度發生。
A.the end point 終點
B.balance point 平衡點
C.equilibrium 平衡
D.steady state 穩態

14. If a system at equilibrium is subject to a stress, the equilibrium is shifted in the direction that tends to relieve the stress. This is a statement of ____.
如果處於平衡狀態的系統受到壓力，則平衡向趨向於減輕壓力的方向移動。 這是____的陳述。
A.the Stressor theory 壓力源理論
B.the equilibrium constant 平衡常數
C.the steady state law 穩態定律
D.Le Chatelier's principle 勒夏特利爾原理

15. Delta S >0 then reaction
Delta S >0 然後反應
A.Non spontaneous 非自發性
B.Spontaneous 自發性
C.At equilibrium 達到平衡
D.None of these 這些都不是

16. Thermodynamics is not concerned about
熱力學不關心
A.Energy changes involved in a chemical reaction. 化學反應中的能量變化
B.The extent to which a chemical reaction proceeds 化學反應進行的程度
C.The rate at which a reaction proceeds. 反應進行的速度。
D.The feasibility of a chemical reaction. 化學反應的可行性。

17. First law of thermodynamics furnishes the relationship between
熱力學第一定律提供了兩者之間的關係



A.heat and work 熱量和功
B.heat, work and properties of the system 系統的熱量、功和性能
C.heat and internal energy. 熱量和內能。
D.various properties of the system 系統的各種屬性

18. The combination of elements which forms ionic bond is
形成離子鍵的元素組合是
A.boron – fluorine 硼 – 氟
B.carbon – chlorine 碳 – 氯
C.potassium – bromine 鉀 – 溴
D.sulphur – oxygen 硫 – 氧氣

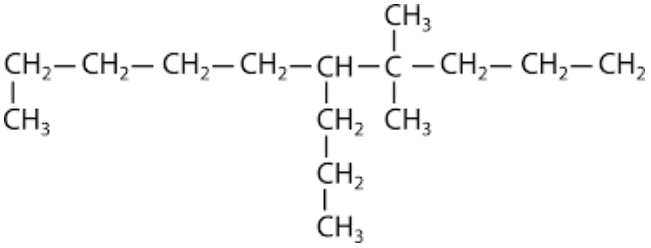
19. The number of elements known at present is ___.
目前已知的元素數量是___。
A.31
B.114
C.63
D.75

20. The atomic number of Sulphur (S) is 16. Identify the number of electrons in each shell of Sulphur.
硫（S）的原子序數為 16。確定硫磺每個殼層中的電子數。
A.2, 8, 6
B.2, 8, 8
C.2, 2, 8, 4
D.2, 4, 8, 2

21. 50 ml of a 1 M solution is diluted until the final volume is 80ml. How much water was added in ml?Write answer in number.
將 50ml 的 1M 溶液稀釋至最終體積為 80ml。加了多少水（以毫升為單位）？用數字寫下答案。

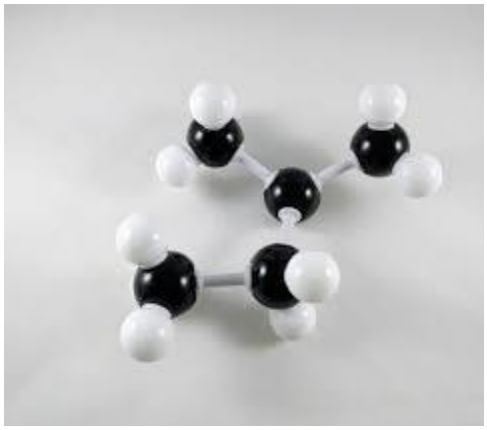
Answer (in number) 答案(數字): _____

22. How many methyl groups are on the following molecule?
下面的分子上有多少個甲基？



Answer (in number) 答案(數字): _____

23. What is the minimum number of carbon atoms of an alkane must have to form an isomer?
烷烴的最少碳原子數是多少才能形成異構體？



Answer (in number) 答案(數字): _____

24. What is the oxidation number of chlorine in ClO_3^-? Write answer just number.
ClO_3^- 中氯的氧化數是多少？ 只寫答案數字。

Answer (in number) 答案(數字): _____

25. Consider the following reaction : SO_2 (g) + NO_2 (g) ↔ SO_3 (g) + NO (g) had reached a state of equilibrium, was found to contain 0.40 M SO_3 , 0.30 M NO, 0.15 M NO_2 , and 0.20 M SO_2. Calculate the equilibrium constant for this reaction. Write answer in number
考慮以下反應：
SO_2 (g) + NO_2 (g) ↔ SO3 (g) + NO (g)
已達到平衡狀態，發現含有 0.40 M SO_3、0.30 M NO、0.15 M NO_2 和 0.20 M SO_2。計算該反應的平衡常數。 用數字寫答案

Answer (in number) 答案(數字): _____