Oxford Cambridge and RSA

A Level Chemistry B (Salters)

H433/01 Fundamentals of chemistry

The Chemical Industry

Question Set 6

Multiple Choice Questions

1 Which statement about testing for nitrate(V) ions is correct?

A They give off ammonia gas when warmed with sodium hydroxide solution.

B Ammonia is detected because it turns blue litmus paper red.

C Aluminium is used to reduce nitrate(V).

D Nitrate(V) ions are oxidised.

Your answer ☐ **[1]**

2

Nitrogen dioxide reacts with carbon monoxide as in the equation below.

$$NO_2 + CO \rightarrow NO + CO_2$$

The mechanism is:

$$NO_2 + NO_2 \rightarrow NO + NO_3 \quad \text{Slow}$$

$$NO_3 + CO \rightarrow NO_2 + CO_2 \quad \text{Fast}$$

Which expression is the correct rate equation?

A Rate = k $[NO_2]$ [CO]

B Rate = k $[NO_2]^2$ [CO]

C Rate = k [CO]

D Rate = k $[NO_2]^2$

Your answer ☐ **[1]**

3 Which statement about a by-product of an industrial reaction is correct?

A It is formed in the same reaction as the product.

B It is formed when the reactants react in a different way.

C It is in the equation for the reaction.

D It is a minor reactant in the reaction.

Your answer ☐ **[1]**

4 Which statement about the rate determining step of a reaction is correct?

A It is the fast step.

B It cannot involve a catalyst.

C It does not involve zero order reagents.

D It is always between two first-order reagents.

Your answer ☐ **[1]**

5 Which statement about the Arrhenius equation is correct?

A A plot of ln k against T gives a straight line.

B When T is very large ln k almost equals ln A.

C E_a is the gradient of a plot of ln k against $1/T$.

D A plot of k against $1/T$ gives a straight line.

Your answer ☐ **[1]**

6 Which statement about the manufacture of methanol is correct?

$$CO(g) + 2H_2(g) \rightleftharpoons CH_3OH(g) \quad \Delta_r H = -91\,kJ\,mol^{-1}$$

A The best yield of methanol is obtained at high temperature.

B A catalyst increases the yield of methanol.

C The pressure used is limited by the cost of energy and machinery.

D The best yield of methanol is obtained at low pressure.

Your answer ☐ **[1]**

7 Which statement about enzyme catalysed reactions is correct?

A The rate determining step is always the formation of an enzyme substrate complex.

B They always speed up at higher temperatures.

C The rate equation can vary depending on the substrate concentration.

D They are zero order with respect to enzyme concentration.

Your answer ☐ **[1]**

8 The reaction for the formation of sulfur trioxide is shown below.

$$2SO_2(g) + O_2(g) \rightleftharpoons 2SO_3(g)$$

60 cm^3 of sulfur dioxide are mixed with 60 cm^3 of oxygen and allowed to reach equilibrium.

What is a possible equilibrium mixture from this reaction?

	Volume SO_2 / cm^3	**Volume O_2 / cm^3**	**Volume SO_3 / cm^3**
A	0	0	120
B	50	55	10
C	48	54	18
D	20	30	40

Your answer ☐ **[1]**

Total Marks for Question Set 6: 8