

Chemistry - 2004

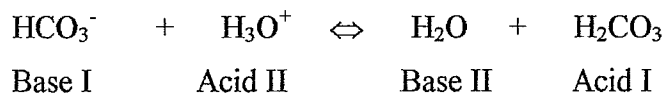
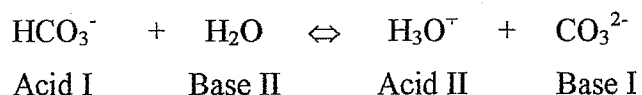
Trial HSC Exam

Suggested Answers

	A	B	C	D
1			X	
2		X		
3				X
4			X	
5		X		
6			X	
7				
8			X	
9		X		
10		X		
11			X	
12		X		
13				X
14	X			
15			X	

SECTION 1 - Part B

Q. 16:



Q.17:

(a) (i) ethylbutanate

(ii) $\text{CH}_3\text{CH}_2 - \text{O} - \text{CO} - \text{CH}_2 - \text{CH}_3$ (iii) Conc H_2SO_4

(iv) Heating under reflux because reactions occur near boiling points of the reactants. Reflux collects and returns vapours driven off by heating.

Q.18:

- (a) Pressure released, gas released out of solution as it stays in only because of high pressure in container.
- (b) Dissolving as is exothermic - dissolving produces heat - we remove it by refrigeration - more goes in to produce heat.

Q.19:

- (a) Iodine 131
- (b) Used in therapy for thyroid cancer.
- (c) Has short half life, must be produced close to point of usage otherwise has decayed beyond point of usage if has to travel too far.

Q.20:

(a) Moles H_2SO_4 left

$$2.447\text{L} \quad \text{NH}_3 = .1 \text{ moles}$$

$$\text{H}_2\text{SO}_4 = \frac{.5 \times 200}{1000} = .1 \text{ moles}$$

From equation 2 moles NH_3 needs 1 mole H_2SO_4

$$1 \text{ mole NH}_3 = 0.5 \text{ moles H}_2\text{SO}_4$$

$$0.1 \text{ mole NH}_3 = 0.05 \text{ moles H}_2\text{SO}_4$$

$$0.1 - 0.05 = 0.05$$

Therefore 0.05 moles H_2SO_4 remains

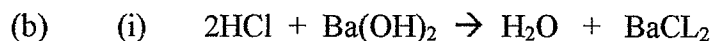
$$(b) \quad \frac{.05 \times 700}{1000} = \frac{.107 \times V}{1000}$$

$$V = \frac{.05 \times 200}{1000} \times \frac{1000}{.107}$$

$$= 93 \text{ mls NaOH}$$

Q.21:

(a) acid HB



$$(ii) \quad \text{Moles acid} = \frac{0.03 \times 15}{1000} = .00045$$

$$\text{Moles alkali} = \frac{0.01 \times 20}{1000} = .0002$$

As 2 lots acid use one lot alkali

$$\frac{.00045}{2} \quad .00025 \text{ moles alkali}$$

$$- .0002$$

$$.00005 \text{ moles alkali left}$$

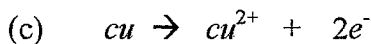
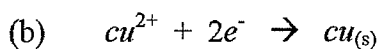
$$= [\text{POH}] = 5 \times 10^{-5}$$

$$\text{PH} = \frac{10^{-5}}{5 \times 10^{-5}} = 2 \times 10^{-10}$$

$$\text{PH} = 9.69$$

Q.22:

(a) copper sulfate solution

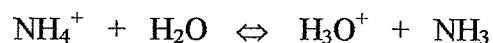
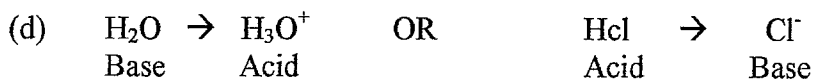


Q.23:

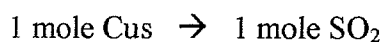
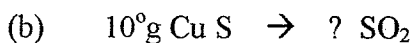
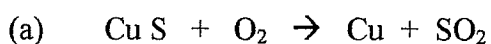
(a) Lowry - Bronstead

Anything that can donate a proton (H^+) releases H^+ in solution(b) NH_4NO_3

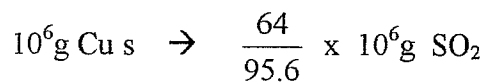
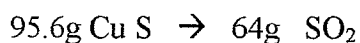
When in water

As H^+ ions produced solutions are acidic(c) H_2O is acting as a base as it accepts a H^+ to become H_3O^+ 

Q.24:



$$63.6 + 32 \qquad 32 + 16 + 16$$



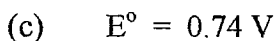
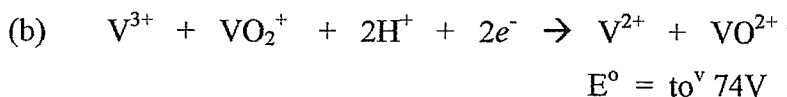
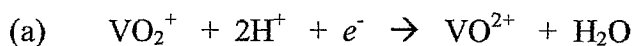
$$= \frac{669456 \text{g}}{64} \text{ SO}_2$$

$$= 10460.25 \text{ Moles SO}_2$$

$$\times 24.5 =$$

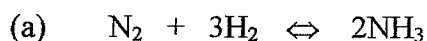
$$256276 \text{ L SO}_2$$

Q.25:



(d)

Q.26:



(b) (i) Compressing \rightarrow increased pressure - reaction goes to right as this reduces pressure
 4 molecules to 2

(ii) Higher temperatures would accelerate reaction but also send equilibrium to left (less product).

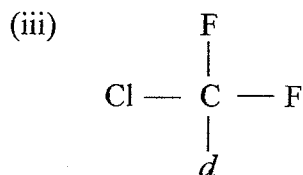
(c) Entering gas stream is closely monitored to keep $\text{N}_2 : \text{H}_2$ about 1 to 3 as gases left after reaction are recycled as well as new gas added.

(d) Fertilisers - explosives

Q.27:

(a) (i) Chlorine

(ii) Spray can propellants



(b) Melting Point

O_3 higher MPt than O_2 as molecules are bigger, therefore need more energy to turn liquid into a gas.