Zeolites I3

Definitions

Zeolites

crystalline aluminosiliates that are built up of tetrahedral arrangements of SiO_4 and AlO_4 units

Construction

$Al(OH_4)^-$ and $Si(OH_4)$ units . the negative Aluminium oxide is associated with a positive ion. if this ion is H^+ then the material is an acid, if it is a group 1 or 2 metal then these ions may be exchanged with other ions. (Si and Al units can be condensed to form dimers)

NOTE: regular arrangement at angstrom level. 1. molecular sieve. 2. acid catalyst. 3. ion exchange (with the cations associate with the aluminium)

procedure

preparation

task one

prepare 0.01 $ CaCl_{2}.6H_{2}
O solution$

1. (accurately) weight 200mg of Calcium chloride(?).
2. transfer to 100ml volumetric flask, and make up to the mark with deionised water.

task two

0.01M EDTA solution.

1. (accurately) weight 200mg of ETDA disodium salt. transfer to 250ml volumetric flask, and make up to the mark with deionised water.

##Task A

1. Weight out (accurately) 200mg of Zeolite.
2. add to 100ml volumetric flask.
3. add 75ml of $CaCl_2$ solution.
4. Add a stirrer bar. (stir for 5 min)

5. Gravity filter the solution 250ml conical flask. (removing zeolite and stirrer bar)
6. Pipette 25ml of filtered solution into another 250ml conical flask.
7. add 3ml of pH 10 buffer.
8. Pinch of Eriochrome black T, while swirling.
9. Titrate with EDTA solution prepared. (end point colour change to blue.)

Part B

task 1 (concurrent task 2)

1. Add 15ml Glacial acetic acid, 15ml 1-pentanol, and 1ml Concentrated sulphuric acid to a 50ml round bottomed flask.
2. swirl gentle and add boiling chip
3. attach condenser and boil gentle under reflux for 1 hour. (on a heating mantle)

task 2

1. Add 15ml Glacial acetic acid, 15ml 1-pentanol, and 2g Zeolite to a 50ml round bottomed flask.

2. swirl gentle and add boiling chip
3. attach condenser and boil gentle under reflux for 1 hour. (on a heating mantle)

task 3

1. after cooling fiter zeolite mixture
2. pour mixture into separating funnel (containing 50ml water)
3. stopper funnel and shake gently
4. Allow to separate, and run off lower layer (containg water, acetic acid and other impurities)

task 4

5. repeat filtering process with Sulphuric acid solution.

Task 5

1. wash both solutions with 25ml water

results

1. Weight of Calcium Chloride(?) for solution 1= _____
2. Weight of EDTA disodium salt for solution 2= _____
3. weight of Zeolite.=_____
4. Titration Table

	Final Reading	Initial Reading	Volume Added
Titration#1			
Titration#2			
Titration#3			
Titration#4			

5. Density and smell of oil, Zeolite solution_____
6. Density and smell of oil, sulphuric acid solution_____

Questions.