Preparation and properties of carbonic acid (Item No.: P7158300)

Task and equipment

Information for teachers

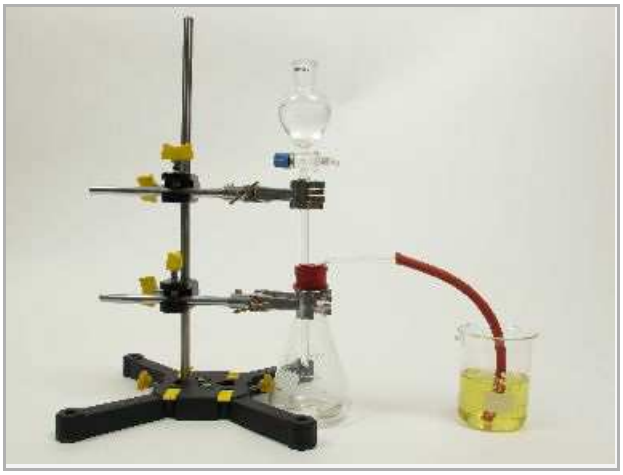
Preparation and properties of carbonic acid (Item No.: P7158300)

Task and equipment

Task

What are the properties of carbonic acid?

Prepare carbonic acid on the basis of marble and study its properties.



Equipment

Position No.	Material	Order No.	Quantity
1	Protecting glasses, clear glass	39316-00	1
2	Wash bottle, 250 ml, plastic	33930-00	1
3	Grad.cylinder,high,PP,50ml	46287-01	1
4	Dropping funnel with drip nozzle, 50ml	36912-00	1
5	Rubber tubing, i.d. 6 mm	39282-00	1
6	Glass beaker DURAN®, short, 250 ml	36013-00	1
7	Erlenmeyer flask, narrow neck, PN 29	36424-00	1
8	Rubber stopper 26/32, 2 holes 7 mm	39258-02	1
9	Pipette with rubber bulb	64701-00	1
10	Glass tube,right-angled, 10 pcs.	36701-52	(1)
11	Universal clamp	37715-00	2
12	Support base, variable	02001-00	1
13	Boss head	02043-00	2
14	Ring with boss head, i. d. = 10 cm	37701-01	1
15	Wire gauze with ceramic, 160 x 160 mm	33287-01	1
16	Support rod, stainless steel, l=370 mm, d=10 mm	02059-00	1
	Butane burner f.cartridge 270+470	47536-00	1
	Butane catridge CV 300 Plus, 240 g	47538-01	1
	Glycerol, 250 ml	30084-25	1
	Marble, pieces 1000 g	30140-70	1
	Hydrochloric acid 37 %, 1000 ml	30214-70	1
	Water, distilled 5 l	31246-81	1
	Liquid Indicator pH1-13 UNISOL113	47014-02	1

Set-up and procedure

Set-up

Hazards

- Acids cause extensive burns. Put on protective glasses!
- Use some glycerine to make rubber-glass joints slippery!

Set-up

Set up the support system according to Fig. 1 - Fig. 4.

Fig. 1

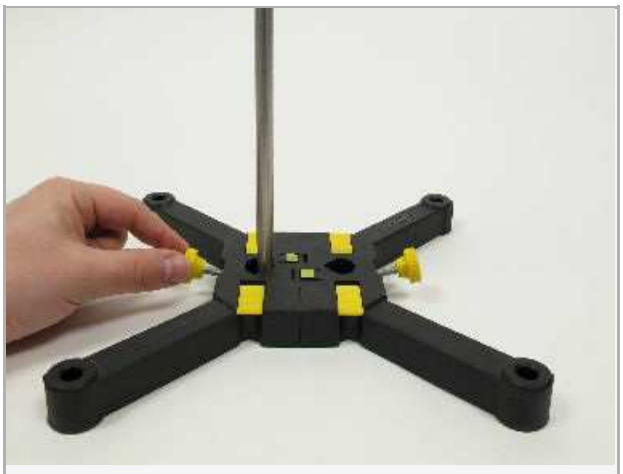


Fig. 2

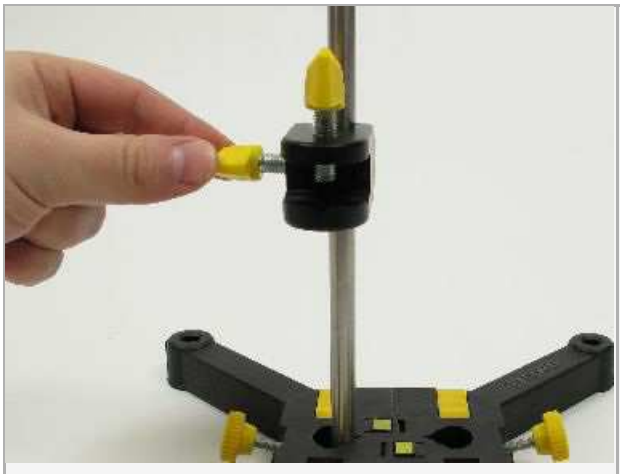


Fig. 3

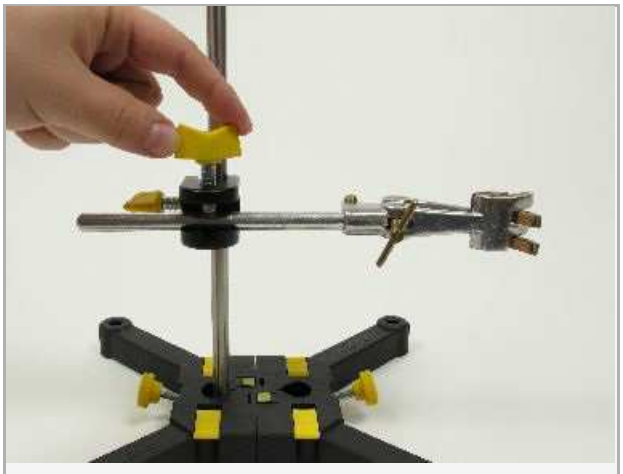


Fig. 4

Attach the Erlenmeyer flask to the universal clamp (Fig. 5) and put two medium-sized pieces of marble into it (Fig. 6).

Fig. 5

Fig. 6

Carefully slip the dropping funnel through one hole of the rubber stopper (use some glycerine to make it slippery) (Fig. 7) and the short leg of the right-angled glass tube through the other hole (Fig. 8).

Fig. 7

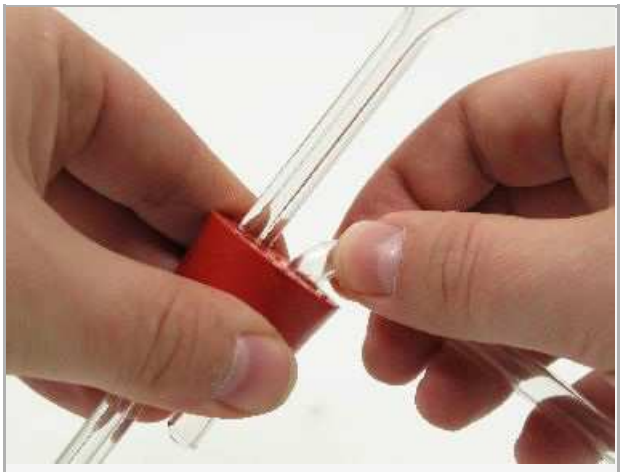


Fig. 8

Seal the Erlnmeyer flask by means of the stopper (Fig. 9) and fix the dropping funnel carefully to the support system (Fig. 10 - Fig. 12).

Fig. 9

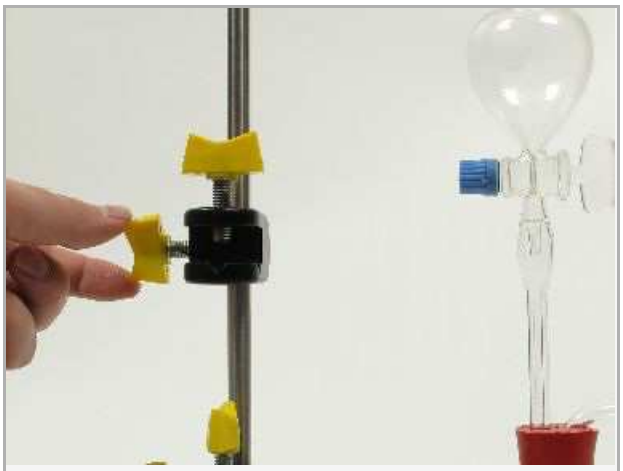


Fig. 10

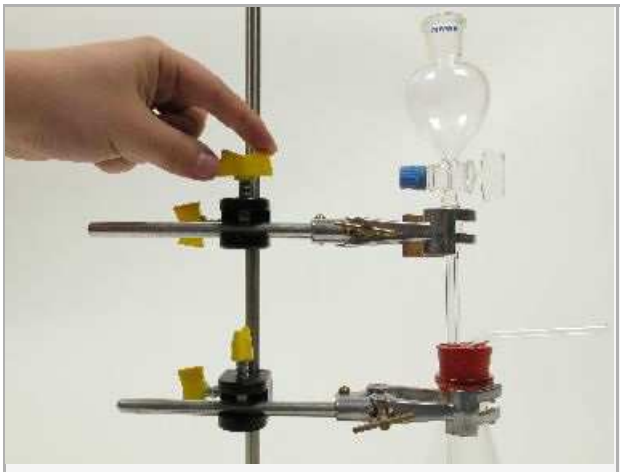


Fig. 11

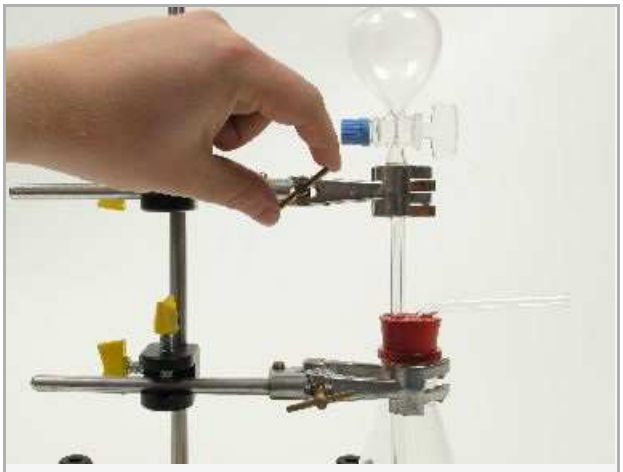


Fig. 12

Attach a rubber tubing (length approximately 25 cm) to the free end of the right-angled glass tube (Fig. 13). Fill the glass beaker half full with distilled water (Fig. 14), place it next to the Erlenmeyer flask and dip the free end of the rubber tubing into the distilled water (Fig. 15).

Robert-Bosch-Breite 10
D - 37079 Göttingen
Tel: +49 551 604 - 0
Fax: +49 551 604 - 107
info@phywe.de
www.phywe.com

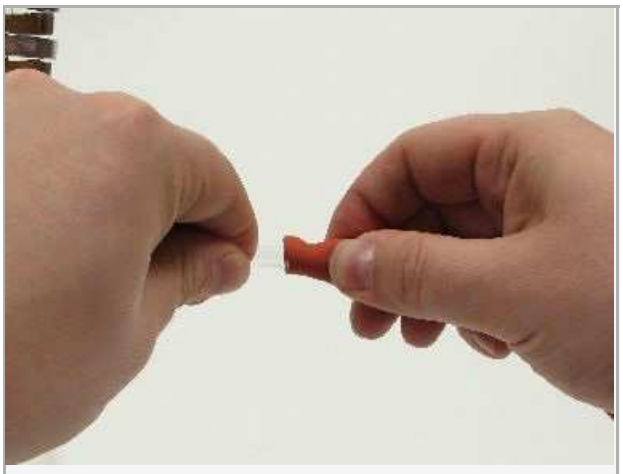


Fig. 13


Fig. 14

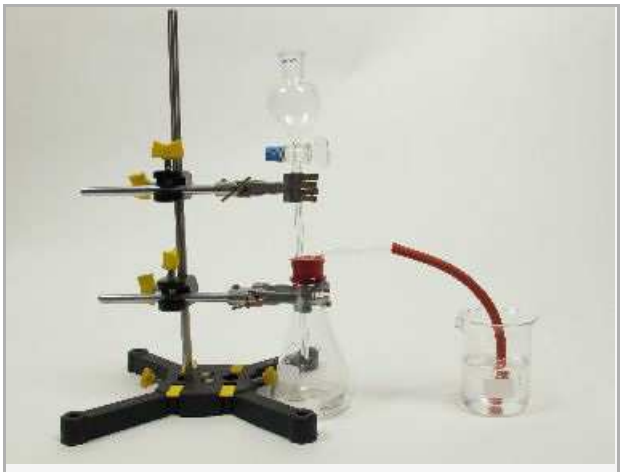


Fig. 15

Procedure

Close the tap of the dropping funnel (Fig. 16) and fill it with 40 ml of the 5% hydrochloric acid (Fig. 17). Add some drops of the universal indicator solution to the distilled water (Fig. 18).

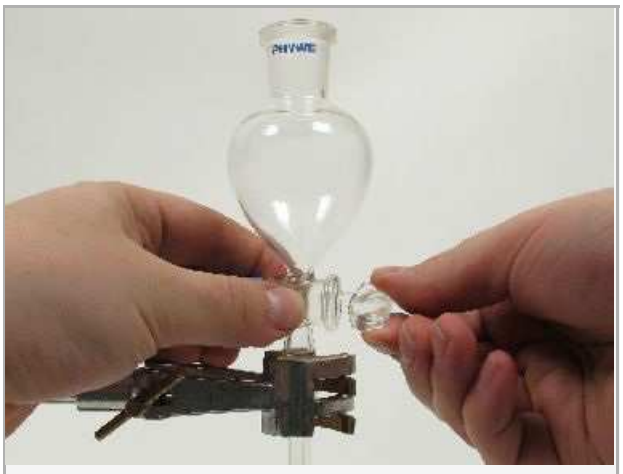


Fig. 16

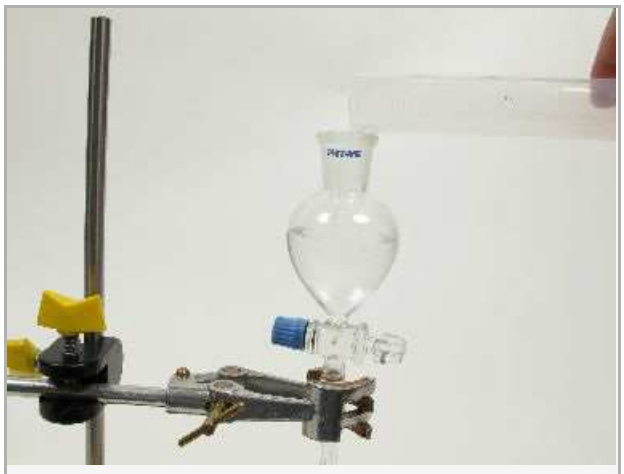


Fig. 17

Fig. 18

Open the tap of the dripping funnel so that the hydrochloric acid drops ono the marble (Fig. 19).

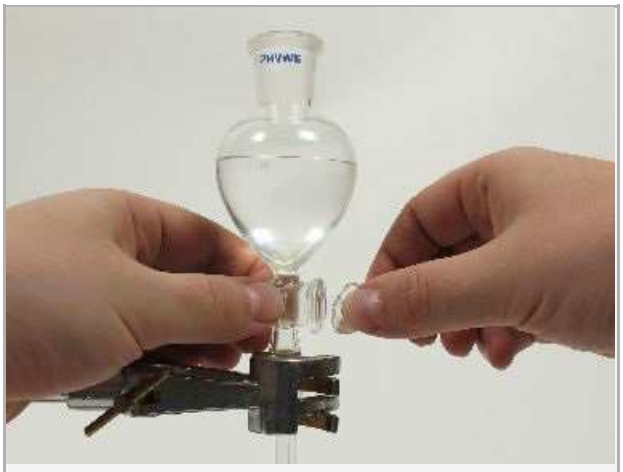


Fig. 19

Finish the experiment when all the hydrochloric acid has been used and dismount the whole apparatus. Replace the universal clamp by the support ring (Fig. 20) and place the wire gauze square on top of it (Fig. 21). Put the glass beaker onto the wire gauze square and heat the solution that has been obtained (Fig. 22).

Fig. 20

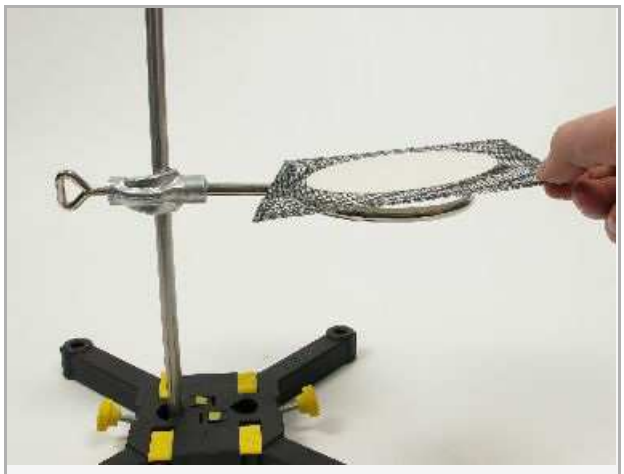


Fig. 21

Fig. 22

Waste disposal

Fill the content of the Erlenmeyer flask into the collecting tank for acids and alkalis. The marble pieces must be removed beforehand.

Report: Preparation and properties of carbonic acid

Result - Observations

Write down your observations.

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Evaluation - Question 1

Enter the observed properties into the general substance description form. Add the missing information with the aid of the textbook.

	carbonic acid	1
	H_2CO_3	1
	colourless	1
	liquid	1
	Carbonic acid does not occur in pure form.	1
	Carbonic acid does not occur in pure form.	1
	Decomposes easily especially when being heated; that is why pure carbonic acid does not exist; causes a universal indicator or litmus to turn red.	1
	No technical use, ingredient of mineral waters.	1

Robert-Bosch-Breite 10
D - 37079 Göttingen
Tel: +49 551 604 - 0
Fax: +49 551 604 - 107
info@phywe.de
www.phywe.com

Evaluation - Question 2

A nearly identical set-up has already been used for preparing what substance? In what way has the presence of this substance been indicated?

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Evaluation - Question 3

Carbonic acid can therefore be considered as a compound of what two substances? Write down the corresponding word equation.

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