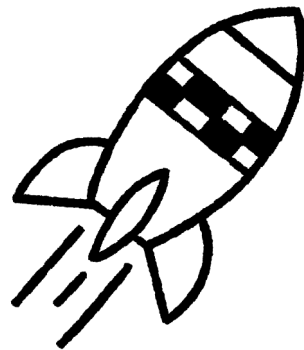


Oksaydhka birta iyo oksaydhka aan-birta ahayn (Metal oxides and non-metal oxides)



Sayniska

Cutub: Aashito iyo sal (Acids and bases)

Natiijo

Waxaan qeexi karaa sifooyinka oksaydhka birta iyo aan-birta ahayn oo waxaan qori karaa isla'egyo matalaya falgal (reaction) oo oksaydhka birta la yeesho aashito.

Erayada muhiimka ah

oksaydh bir (metal oxide)

oksaydh aan-bir ahayn (non-metal oxide)

ku darid xad dhaaf (adding to excess)

Erayada muhiimka ah

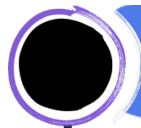
Oksaydh bir (metal oxide) wuxuu ka kooban yahay atamka birta oo ku xidhan atamka oksijiinta.

Oksaydh aan-bir ahayn (non-metal oxide) wuxuu ka kooban yahay atamka aan-birta ahayn oo ku xidhan atamka oksijiinta.

Ku darid xad dhaaf (adding to excess) waa marka fal-celiye (reactant) uu joogo tiro ka badan inta lagama maarmaanka u ah inuu si buuxda u falgalo (reaction).

Qaabka casharka

Oksaydhka birta iyo oksaydhka aan-birta ahayn (Metal oxides and non-metal oxides)



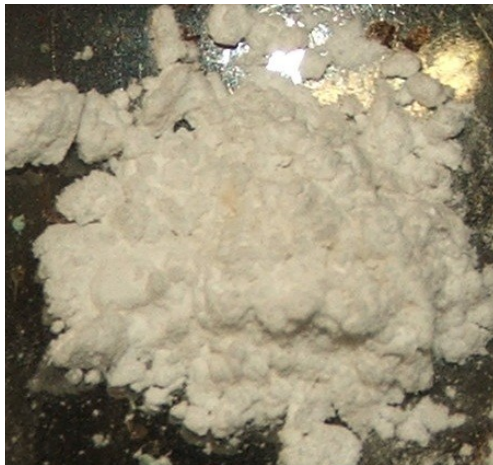
Oksaydhka birta (Metal oxides)



Oksaydhka aan-birta ahayn (Non-metal oxides)

Oksaydh bir (metal oxide) wuxuu ka kooban yahay atamka birta oo ku xidhan atamka oksijiinta. Waxaa jira oksaydh bir (metal oxide) oo badan oo jira.

Tusaalooyinka oksaydhka birta (metal oxides):



oksaydh calcium (calcium oxide)



oksaydh chromium (chromium oxide)



oksaydh bir (iron oxide)

Dooro dhammaan odhaahyada saxda ah.

a

Oksaydh bir (metal oxide) waa meesha atamka birta ay ku xidhan yihiin oksijiin.



b

Oksaydh bir (metal oxide) waa halka atamka birta (metal atom) lagu daro oksijiin (oxygen).

c

Kaarboon laba-oksaydh (Carbon dioxide) waa tusaale oksaydh bir (metal oxide).

d

Oksaydh qalin (Silver oxide) waa tusaale oksaydh bir (metal oxide).



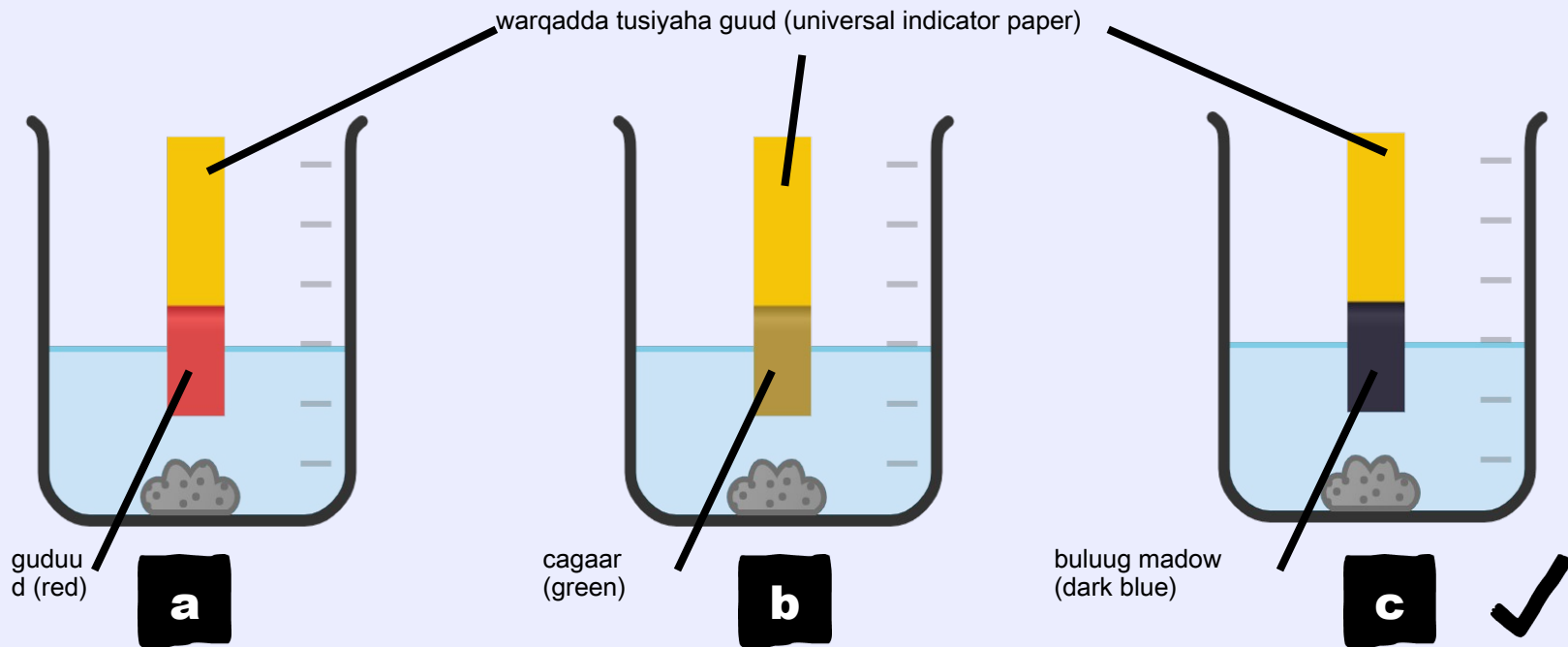
Oksaydhyaasha birta (Metal oxides) waa saldhigyo (bases); marka lagu milo biyo (water) waxay u rogi doonaan tusiyaha guud (universal indicator) midab buluug (blue colour).

Daawo fiidiyowga (video) si aad u a



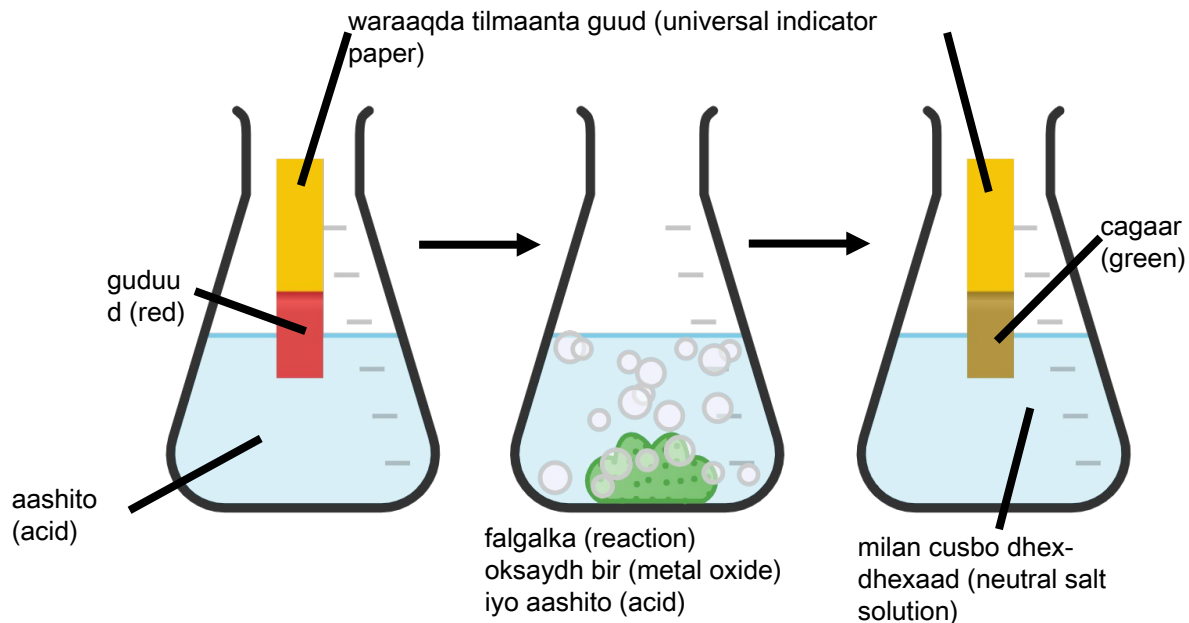
1. Oksaydh magnesium (Magnesium oxide) oo laga sameeyay falgalka (reaction) magnesium iyo oksijiin (oxygen).
2. Oksaydh magnesium (Magnesium oxide) oo lagu milay biyo (water) ka dibna lagu tijaabiyay tusiyaha guud (universal indicator) si loo muujiyo milan (solution) alkaline ah oo la sameeyay.

Midabkee ayay tusiyaha guud (universal indicator) u rogi doonaa marka oksaydh bir (metal oxide) la geliyo biyo (water)?



Oksaydhyaasha birta (Metal oxides) waa saldhigyo (bases) waxayna la falgali karaan (react) aashito (acids) si ay u dhex-dhexeeyaan (neutralise).

Milan (solution) dhex-dhexaad (neutral) waa cagaar (green), pH7.



iska'egta guud ee falgalka (reaction) ee u dhexeeya bir-oksaydh (metal oxide) iyo asiidh (acid) waa:

bir-oksaydh + asiidh $\rightarrow$ cusbo bir ah + biyo

tusaale: magnesium oxide + hydrochloric acid $\rightarrow$ magnesium chloride + biyo

Magaca cusbada (salt) ee ka soo baxa falgalka dhexdhexaadinta (neutralisation) wuxuu ku xiran yahay nooca asiidhka la isticmaalay.

magaca asiidhka	dhammaadka magaca cusbada birta
hydrochloric	chloride
sulfuric	sulfate
nitric	nitrate

lead oxide + hydrochloric acid → lead chloride + biyo

lead oxide + sulfuric acid → lead sulfate + biyo

lead oxide + nitric acid → lead nitrate + biyo

Bir-oksaydh (Metal oxides)

Magacaabi asiidhka la isticmaalay markii zinc oxide falgalay si loo sameeyo zinc sulfate.

a hydrochloric acid

b sulfuric acid



c sulfate acid

d nitric acid

Waa nooc ee falgal (reaction) oo ka dhex dhaca oksaydhka birta (metal oxides) iyo aashitada (acids)?

a

oksaydhaynta (oxidation)

b

aashitaynta (acidification)

c

dhex-dhexaadinta (neutralisation)

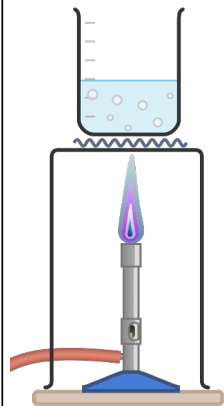


Waxaa jira saddex qaybood oo tijaabada (experiment) ah:

1. Dhex-dhexaadinta (Neutralising) aashitada (acid) (sulfuric acid) iyadoo la isticmaalayo sal (base) oksaydh bir (metal oxide) (copper oxide).
2. Shaandhaynta (Filtering) si looga saaro sal (base) aan milmi karin (insoluble) (copper oxide) ee xad-dhaafka ah ee isku dhafka falgalka (reaction mixture).
3. Kiristaalaynta (Crystallising) sheyga (product) copper sulfate.

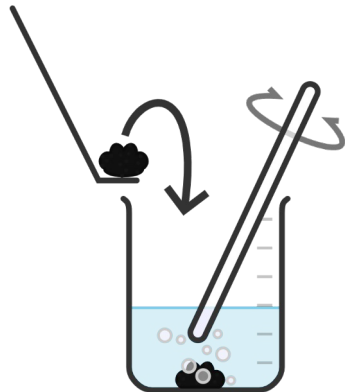
Oksaydhka birta (Metal oxides)

Tallaabada 1: Dhex-dhexaadi (Neutralise) aashitada (acid) iyadoo la isticmaalayo sal (base) oksaydh bir (metal oxide).



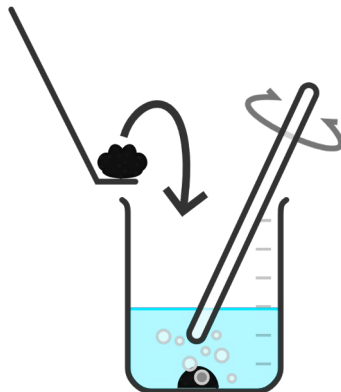
1. Si tartiib ah u kululee (warm) sulfuric acid ilaa aad bilowdo inaad aragto xumbo (bubbles), ka dibna dami kulaylka (heat).

2. Ku dar 1 spatula oo copper oxide ah.

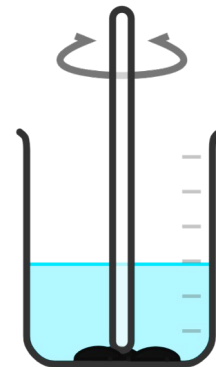


3. Walaq (Stir) ilaa uu joogo fizzing-ga oo aadan arki karin copper oxide madow.

4. Ku dar spatula kale oo copper oxide ah.



5. Walaq (Stir) ilaa uu joogo fizzing-ga oo aadan arki karin copper oxide.



6. Ku celi (Repeat) tallaabooyinka 4 iyo 5 ilaa aan xumbo (bubbles) kale la arkin oo copper oxide madow hadhay. Copper oxide-ga waxaa lagu daray xad-dhaaf (excess).

Oksaydhka birta (Metal oxides)

Run mise been?

Marka la falgaliyo copper oxide iyo sulfuric acid, dhammaan copper oxide waa in hal mar lagu daro.



Run



Been



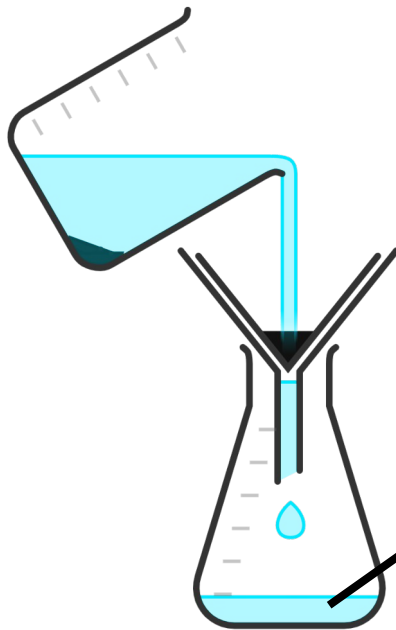
Sabab u sheeg jawaabtaada

- a** Waa in la daraa hal spatula mar (one spatula at a time) ilaa laga daro dhammaan copper oxide-ga.
- b** Waa in lagu daro hal qaaddo (spatula) mar kasta ilaa copper oxide uu ka badnaado (excess).



Tallaabada 2: Shaandheey (Filter) si looga saaro copper oxide-ka badan (excess).

1. Shaandheey (Filter) isku darka falgalka (reaction mixture) si looga saaro copper oxide-ka badan (excess).

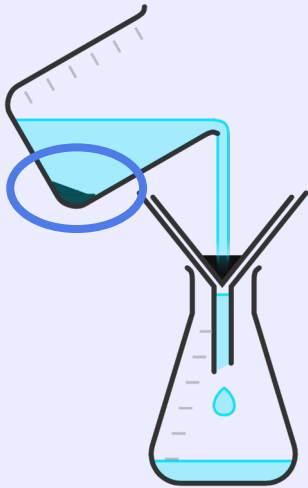


2. Sii daa copper oxide-ka badan (excess) si ammaan ah.

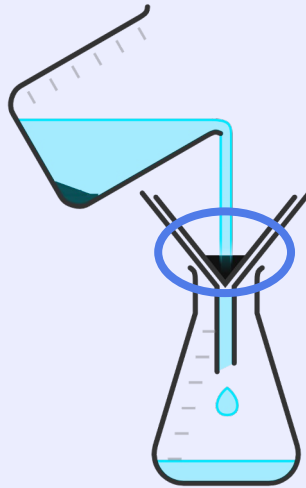
3. Hayso milanka copper sulfate (copper sulfate solution) tallaabada xigta.

Oksaydhka birta (Metal oxides)

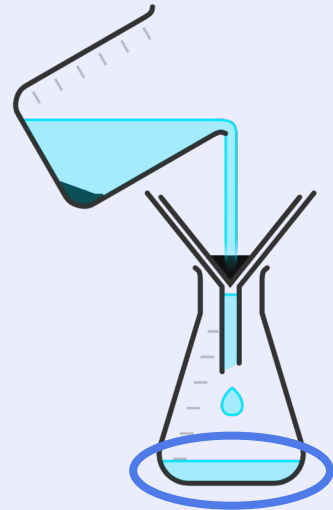
Ka dib shaandhaynta (filtration), maxaa tahay inaad haysato qaybta xigta ee tijaabada (experiment)?



a



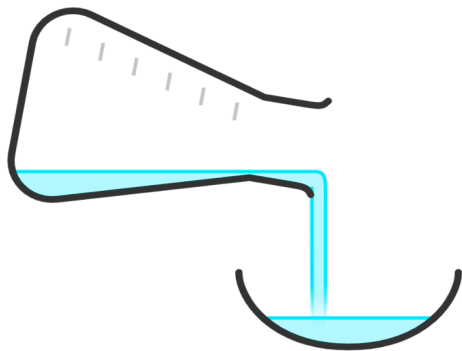
b



c

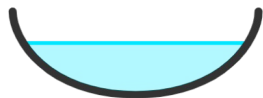


Tallaabada 3: Uumi (Evaporate) biyaha (water) ka baxa milanka copper sulfate (copper sulfate solution) si loo sameeyo kiristaalo copper sulfate (copper sulfate crystals).



1. Ku shub milanka copper sulfate (copper sulfate solution) weel uumis (evaporating basin).

2. Dhig milanka copper sulfate (copper sulfate solution) qol diiran. Ka tag ilaa biyuhu (water) uumiyaan, tani waxay qaadan kartaa dhowr maalmood.



24h+



3. Kiristaaladaada copper sulfate (copper sulfate crystals) waa inay ku sameeyaan weelka uumista (evaporating basin).



kiristaalo copper sulfate (copper sulfate crystals)

Magacow habka loo isticmaalo si loo helo kiristaalo copper sulfate (copper sulfate crystals) oo laga soo qaado milanka copper sulfate (copper sulfate solution).

a

shaandhayn (filtration)

b

uumis (evaporation)



c

dhexdhexaadin (neutralisation)

- 1) Samee shaybaarka (practical) si aad u samayso kiristaalo copper sulfate (copper sulfate crystals) oo ka yimid copper oxide iyo sulfuric acid.
- 2) Qor isla'egta erayada ee falgalka (reaction) copper oxide iyo sulfuric acid si loo sameeyo copper sulfate iyo biyo (water).

1) Natiijooyinkaaga waxay u ekaan karaan kuwan oo kale.

2) Qor isla'egta erayada ee falgalka (reaction) copper oxide iyo sulfuric acid si loo sameeyo copper sulfate iyo biyo (water).

copper oxide + sulfuric acid $\rightarrow$ copper sulfate + biyo (water)



3) Dhammeystir waxyaabaha ka maqan ee fal-celiyeyaasha iyo waxsoosaarka.

3) Dhammeystir waxyaabaha ka maqan ee fal-celiyeyaasha iyo waxsoosaarka.

a) lead oxide + hydrochloric acid → _____ chloride + biyo (water)

b) lead oxide + sulfuric acid → lead _____ + biyo (water)

c) zinc oxide + _____ acid → zinc chloride + _____

d) _____ oxide + _____ acid → zinc nitrate + biyo (water)

e) silver _____ + nitric acid → _____ nitrate + biyo (water)

Jawaabaha:

Metal oxides iyo non-metal oxides



Metal oxides



Non-metal oxides

Non-metal oxide wuxuu ka kooban yahay atamka non-metal oo ku xiran atamka oxygen, tusaale: carbon dioxide.



Carbon dioxide waxaa loo isticmaalaa dab-demiyeaasha.



Nooleyaasha harooyinka waxaa saameyn kara roobka ashitada (acid rain) oo uu keeno wasakhowga sulfur dioxide.

Oksaydh bir-ahaan (non-metal oxide) waa ...

a

atamyo bir ah oo ku xidhan atamyo oksajiin (oxygen).

b

atamyo bir-ahaan (non-metal) ah oo ku xidhan atamyo oksajiin (oxygen).



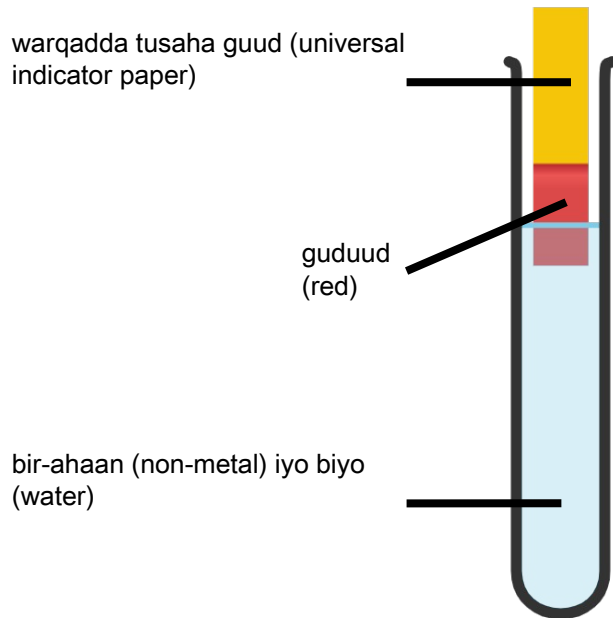
c

atamyo bir-ahaan (non-metal) ah oo ku xidhan atamyo nitrogen.

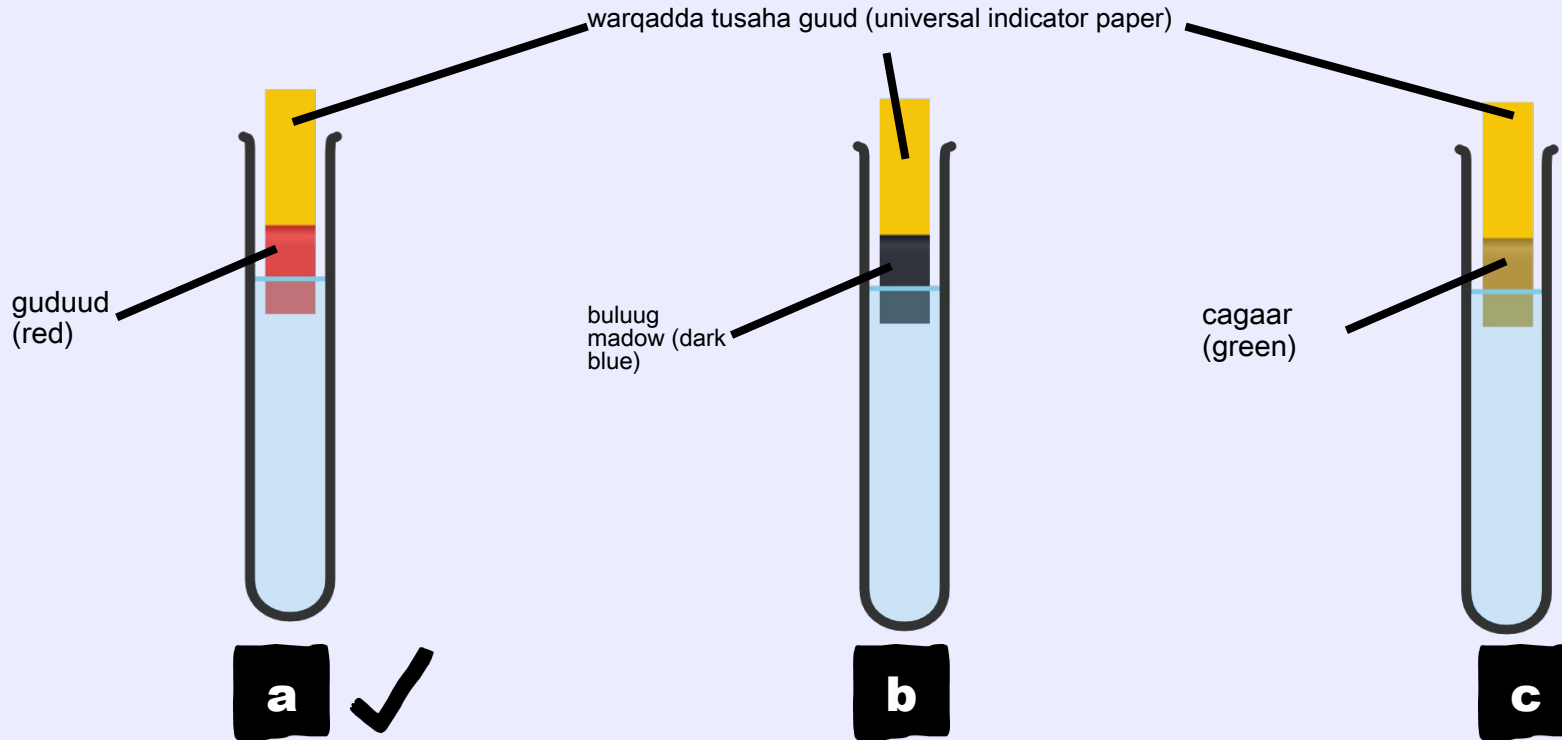
d

atamyo bir-ahaan (non-metal) ah oo ku xidhan atamyo bir ah.

Oksaydh-yada bir-ahaan (Non-metal oxides) ee biyo (water) ku jira waxay sameeyaan milano (solutions) aashito (acidic).



Kee ayaa ku jiri kara oksaydh bir-ahaan (non-metal oxide) oo biyo (water) ku jira?



- 1) Isticmaal warqadda tusaha guud (universal indicator) si aad u tijaabiso (test) pH-ga saddexda oksaydh bir-ahaan (non-metal oxide) ee la geliya

Waxaad isticmaali doontaa:

- 'oksaydh nitrogen oo biyo (water) ku jira'
- 'oksaydh fosforus oo biyo (water) ku jira'
- sulfur dioxide ee biyo (water)

magaca non-metal oxide ee biyo (water)	midabka universal indicator	acid / neutral / alkali
nitrogen oxide		
phosphorus oxide		
sulfur dioxide		

- 3) Qor gabagabo ku saabsan pH-ga non-metal oxides ee biyo (water) adigoo isticmaalaya natiijooyinka tijaabadaada (experiment). Waxaad isticmaali kartaa bilowga jumlada hoose.

(Qaar / dhammaan / midna) non-metal oxides ee biyo (water) ayaa universal indicator u rogay ... sababtoo ah ...

1) iyo 2) Natiiyooyinkaagu waxay u ekaan karaan sidan:

magaca non-metal oxide ee biyo (water)	midabka universal indicator	acid / neutral / alkali
nitrogen oxide	guduud / orange	acid
phosphorus oxide	guduud / orange	aashito (acid)
sulfur dioxide	guduud / orange	aashito (acid)

3) Dhammaan oksaydhka (oxides) ee birta ah ee biyaha (water) ku jira ayaa universal indicator u rogay cas / oranji, sababtoo ah dhammaantood waa aashito (acidic).

Oksaydh bir (metal oxide) wuxuu ka kooban yahay atamka birta (metal atoms) oo ku xidhan atamka oksajiinta (oxygen atoms).

Oksaydhyaasha birta (metal oxides) waa saldhigyo (bases) waxayna la falgali karaan (react) aashito (acids) si ay u dhexdhexaadiyaan (neutralise).

Oksaydh bir (metal oxide) + aashito (acid) → cusbo bir (metal salt) + biyo (water)

Oksaydh aan birta ahayn (non-metal oxide) wuxuu ka kooban yahay atamka aan birta ahayn (non-metal atoms) oo ku xidhan atamka oksajiinta (oxygen atoms).

Oksaydhyaasha aan birta ahayn (non-metal oxides) ee biyaha (water) ku jira waxay sameeyaan milano aashito (acidic solutions).