Lesson 7- Exothermic and Endothermic reactions

Chemistry- Key Stage 3

Energetics

Miss Charlton

During endothermic reactions ...

A

The temperature of the surroundings increases

B

The temperature of the surroundings usually decreases

C

The particles decrease in temperature

D

The particle temperature increases

During endothermic reactions ...

A

Bonds are broken

B

Nothing happens to the bonds

C

New bonds are made

D

Bonds are broken and made

During exothermic reactions ...

A

Chemical energy is given out to the surroundings

B

Thermal energy is taken in from the surroundings

C

Thermal energy is given out to the surroundings

D

Light energy is given out to the surroundings

During exothermic reactions ...

A

The temperature of the surroundings increases

B

The temperature of the surroundings usually decreases

C

The particles decrease in temperature

D

The particle temperature increases

During exothermic reactions ...

A

Bonds are broken

B

Nothing happens to the bonds

C

New bonds are made

D

Bonds are broken and made

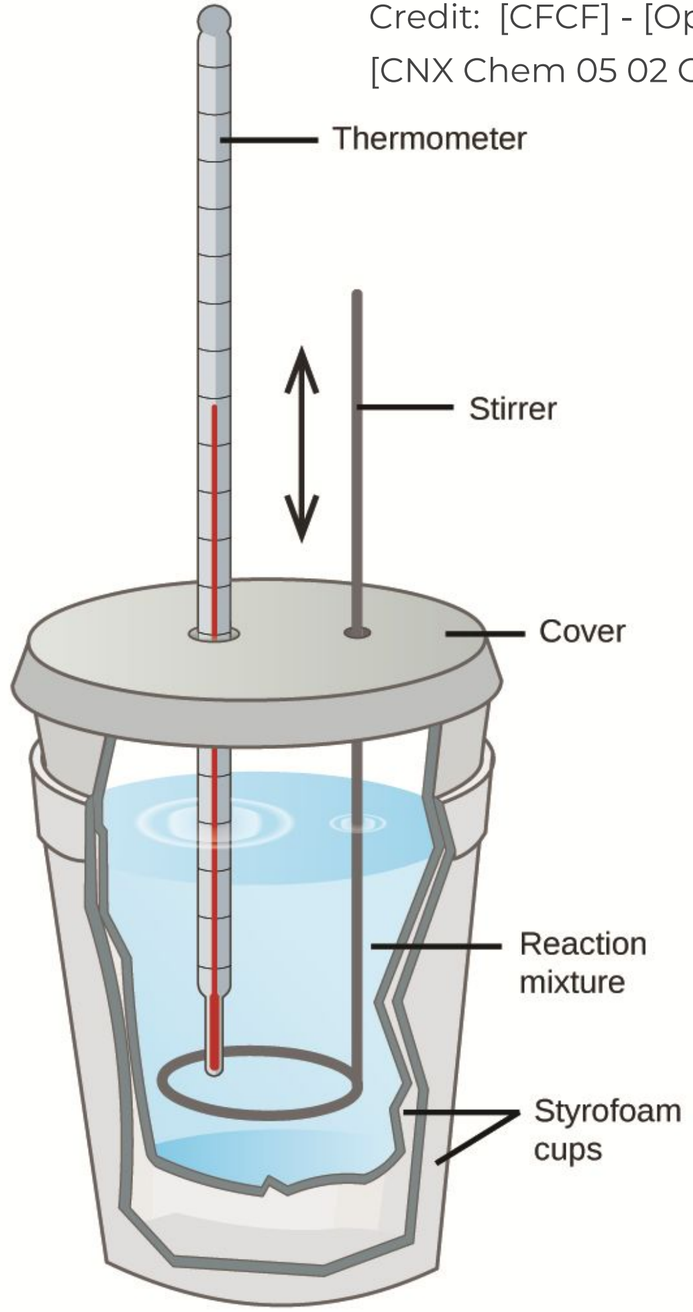
Reaction	Start temperature (°c)	End temperature (°c)	Temperature change (°c)	Exothermic or Endothermic?
Iron filings + copper sulphate	21	25		
Sodium hydroxide + hydrochloric acid	25	31		
Water + ammonium nitrate	20	9		

Water and Ammonium nitrate

$20cm^3$ of water is added to a styrofoam cup, then the temperature is taken. A spatula of ammonium nitrate is added. The mixture is stirred and the temperature is taken every 20 seconds.

Identify the variables: IV- change, DV- measure, CV- same

Remember units!



Credit: [CFCF] - [OpenStax] - [CNX Chem 05 02 Calorim]

How could I make this equipment better?

Source of error during practical work	Suggestion for improvement	How this would improve results
Energy transfer through the beaker	Use a polystyrene cup or insulate the beaker	Reduce energy transfers through the beaker and therefore improve the accuracy of the temperature change
Energy transfer at the surface of the liquids	Use a lid	
Misreading the thermometer		

Answers

During endothermic reactions ...

A

The temperature of the surroundings increases

B

The temperature of the surroundings usually decreases

C

The particles decrease in temperature

D

The particle temperature increases

During endothermic reactions ...

A

Bonds are broken

B

Nothing happens to the bonds

C

New bonds are made

D

Bonds are broken and made

During exothermic reactions ...

A

Chemical energy is given out to the surroundings

B

Thermal energy is taken in from the surroundings

C

Thermal energy is given out to the surroundings

D

Light energy is given out to the surroundings

During exothermic reactions ...

A

The temperature of the surroundings increases

B

The temperature of the surroundings usually decreases

C

The particles decrease in temperature

D

The particle temperature increases

During exothermic reactions ...

A

Bonds are broken

B

Nothing happens to the bonds

C

New bonds are made

D

Bonds are broken and made

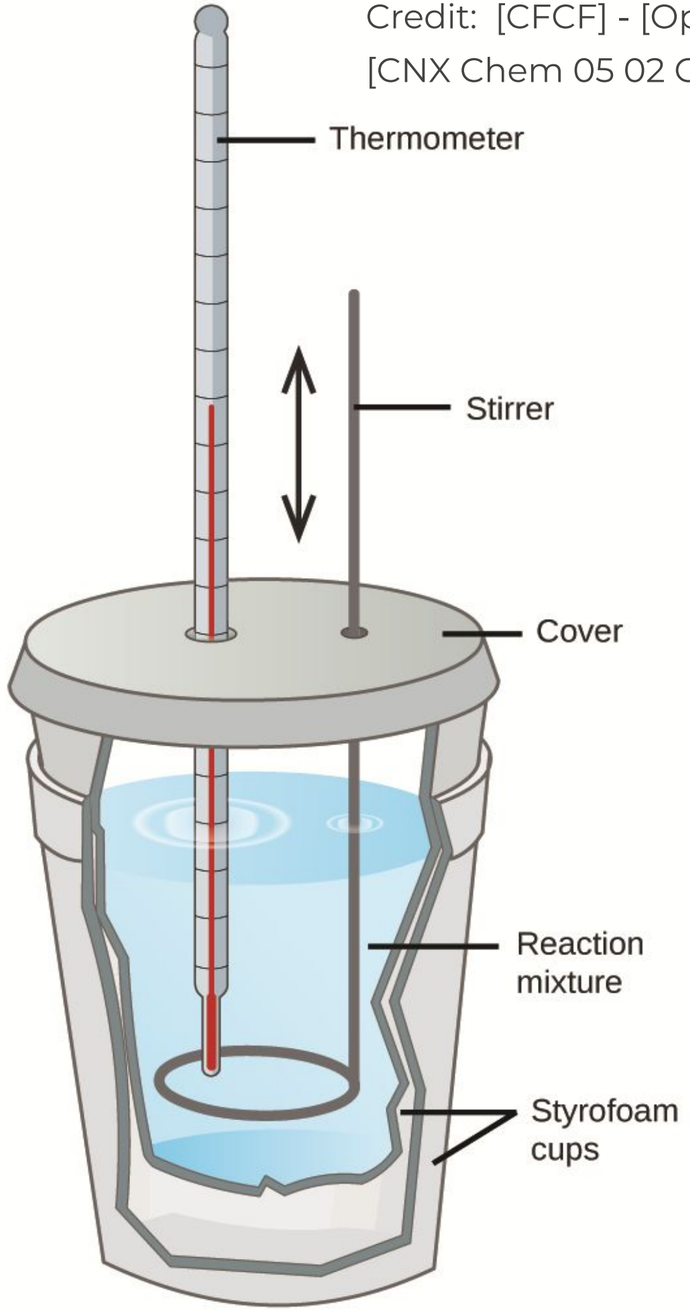
Reaction	Start temperature (°c)	End temperature (°c)	Temperature change (°c)	Exothermic or Endothermic?
Iron filings + copper sulphate	21	25	25-21=**4**	**Exothermic**
Sodium hydroxide + hydrochloric acid	25	31	31-25=**6**	**Exothermic**
Water + ammonium nitrate	20	9	9-20=**-11**	**Endothermic**

Water and Ammonium nitrate

IV: Time (s)

DV: Temperature change (°c)

CV: Material of container and cover, number of stirs, volume of water, mass of ammonium nitrate.



Credit: [CFCF] - [OpenStax] - [CNX Chem 05 02 Calorim]

How could I make this equipment better?

Source of error during practical work	Suggestion for improvement	How this would improve results
Energy transfer through the beaker	Use a polystyrene cup or insulate the beaker	Reduce energy transfers through the beaker and therefore improve the accuracy of the temperature change
Energy transfer at the surface of the liquids	Use a lid	**Reduce energy transfers** and **improve the accuracy** of the temperature change
Misreading the thermometer	Use a digital temperature probe	**Easier to read** – less chance of a mistake