

SASTA OLIPHANT SCIENCE AWARDS 2024

Crystal Discovery

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Hypothesis

- Can I grow a perfect crystal?


Equipment

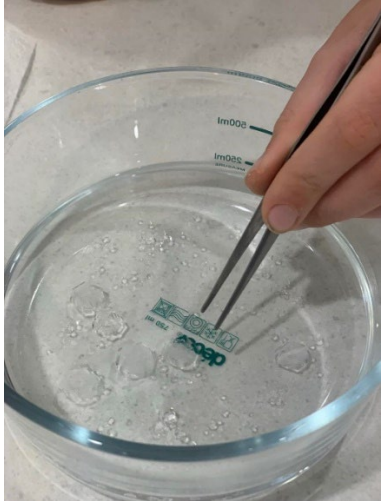



Distilled water	Paper towel
Tap water	Stirrer – spoon
Scales	Tweezers
Glass jars	Fishing Line
Saucepan	Cotton string
Hot water – tap, stove, kettle	Sieve
Potash Alum	Pencil, pop stick, knife for hanging string and fishing line





FIRST ATTEMPT

- 30g potash alum (from mums work)
- 200ml tap water
- Heated water using instant water at 50 degrees
- Fishing line
- Put in a bathroom cupboard

Observations

Date/Time	Description of what the student did, problem encountered and solved	Crystal characteristics	
14.4.24 11:30am	<ul style="list-style-type: none"> - Watched YouTube video - Read instructions - Measured 30g of potash alum and used tap water at 50degrees - Put the container in a cupboard and covered with paper towel <p>Problem – not all potash alum dissolved, poured the water through a sieve into glass container</p>		
15.4.24 8:30am 2:30pm		<p>Few seed crystals on bottom</p> <p>Big seed crystals on bottom</p>	

<p>15.4.24 6:52pm</p> <p>7:13pm</p>	<p>- Took out the big seed crystals with tweezers</p>	<p>6 large crystals</p> <p>Sharp edges, flat bottom</p> <p>Some had more than one growing on each other</p>	
<p>15.4.24 7:13pm</p>	<p>- Reheated the water (mum helped to get it to 50 degrees)</p>		
<p>15.4.24 7:50pm</p>	<p>- Water was now cold, put the seed crystal in a glass jar</p> <p>Problem – I had trouble tying the crystal to the line and the first crystal broke when mum tried to tie it to fishing line.</p>		
<p>16.4.24 5:24pm</p>		<p>Crystal doubled, looks like extra crystals growing on the bottom of the seed crystal.</p> <p>Small crystals are growing on the bottom of jar</p>	

<p>17.4.24 10:49am</p>	<ul style="list-style-type: none"> - Took out the crystal - Reheated the water - took extra crystal off the fishing line with tweezers 	<p>More seed crystals at the bottom</p> <p>1 small crystal growing on fishing line</p> 	 
<p>18.4.24 7am</p>	<ul style="list-style-type: none"> - Need to tighten the fishing line to keep the crystal off the bottom of the jar. (mum helped) 	<p>Looks the same as last time. Not that see-through</p> <p>more seed crystals on the bottom</p>	
<p>19.4.24</p>		<p>Not that see through in the middle</p>	
	<p>Problem: stopped recording when I was checking this crystal when I started the next one.</p>	<p>Crystal not growing anymore. Decided to stop and take it out.</p>	

Conclusion on first attempt

Foggy in the middle, bottom is odd, most sides are smooth but not a proper triangle shape.

The crystal was big and might not have been clear because I didn't use distilled water and maybe not good potash alum.

I didn't record or take photos each time I checked the crystal.

SECOND ATTEMPT

200ml distilled water


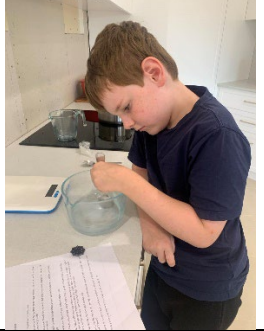



Thermometer

30g potash alum from Ace Chemicals

Metal Spoon to mix

String

Put in a bathroom cupboard

Date/Time	Description of what the student did, problem encountered and solved	Crystal characteristics	
<p>20/4/24 12.26pm</p>	<p>Measured 30g potash alum</p> <p>Measured 200ml distilled water</p> <p>Put it in glass container and into a saucepan mixed it with hot water from kettle, mum helped to me to make sure it reached 50 degrees using thermometer.</p> <p>Problem: mum tipped the wrong water out and I needed to start again.</p>	 	 
<p>21.4.24 5:30pm</p>	<p>Took out seed crystals picked best one and mum helped tie it to string.</p> <p>Heated water to 50 degrees.</p> <p>Waited for water to cool down and put crystal in.</p>	<p>Tonnes of seed crystals growing, small and see through.</p>	
<p>23.4.24 7:23am</p>	<p>Not happy to keep growing this crystal</p>	<p>Lots of seed crystals growing on bottom and string</p> <p>More growing on main crystal.</p>	

Conclusion on second attempt

Didn't want to keep growing this crystal, wanted to start again.

THIRD ATTEMPT

200ml distilled water

Thermometer

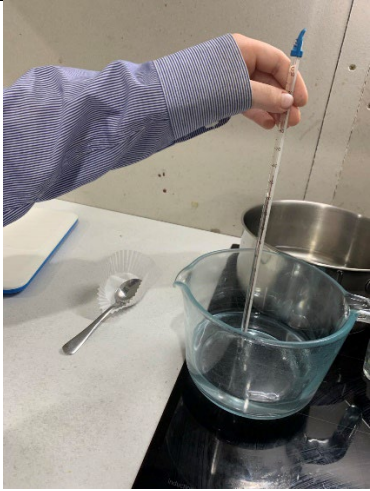

30g potash alum from Ace Chemicals

Seed Crystal

Metal Spoon to mix

String

Put in a bathroom cupboard





Date/Time	Description of what the student did, problem encountered and solved	Crystal characteristics	
22/5/24 6.03pm	Used a seed crystal Measured 30g potash alum Measured 200ml distilled water Put it in glass container and into a saucepan mixed it with hot water from kettle, mum helped to me to make sure it reached 50 degrees using thermometer. Mum helped tie seed crystal to string		
8:10pm	Water cold, put crystal in and put jar in cupboard with paper towel on the top		
23/5/24 6:20pm	No seed crystals growing yet.		
23/5/24	Used tweezers to take off what I could Saw lumps on the top of water, maybe it is getting too cold	Crystals starting to grow on string	
24/5/24 8:15am		Very small crystals growing on string	
25/5/25	Decided to stop growing crystal	Not at see-through as used to be. Required size	

Conclusion on third attempt

Crystal growing on one corner, and up the string, smaller but better shape and better quality than first attempt, it was required size. Didn't record or take photos when I checked the crystal.

FOURTH ATTEMPT

- Potash Alum from Concordia Science Lab – Thermo Fisher Scientific
- 200ml distilled water
- Stored in a kitchen cupboard

Date/Time	Description of what the student did, problem encountered and solved	Crystal characteristics	
2.6.2024 6:35pm	Measured 30g potash allum and 200ml distilled water. Heated the water to 50 degrees using thermometer		
3.6.24 8am 6pm 7:30pm	<p>Took seed crystals out to stop growing.</p> <p>More seed crystals. Reheated the water</p> <p>Water cooled. Mum helped tie seed crystal to fishing line.</p>	<p>3 seed crystals, took them out to stop growing.</p> <p>Clear and flat sides.</p>	
4.6.24 8:00am	<p>Crystals growing on fishing line and seed crystal.</p> <p>Took off what I could</p>		
5.6.24 6pm		Thousands of small crystals on the bottom and crystal is bigger and has flat sides	
		Crystal started to shrink and mold grew on top of water	

Conclusion on fourth attempt

I didn't check this crystal enough, maybe it got too cold and that is why it shrunk. Mold was on the top of the water so I couldn't reheat the water.

Final Conclusion

It took longer than I thought it would, it was hard to grow a perfect crystal.

Acknowledgements

- Mum helped with putting the seed crystals on the string and fishing wire, with hot water and supervision when using the stove.
- Concordia Science Department – materials and information
- Youtube Video on how to grow a crystal <https://www.youtube.com/@ubuffalo>
- Mum for taking pictures and preparing this report and scribing my observations