



**CRYSTAL INVESTIGATION LOGBOOK:
FROM MINERALS TO MAGIC**

**A CRYSTAL INVESTIGATION BY UMAR MATEEN
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Investigation Question:

How do I produce a good looking alum crystal that has great clarity and cuts?

Hypothesis:

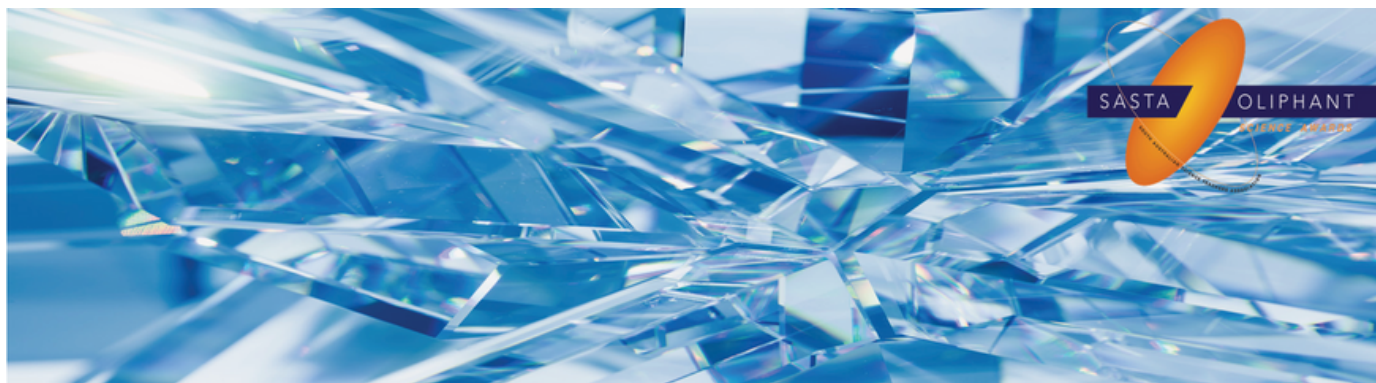
it is hypothesised that if the crystal is kept in a stable temperature and environment, along with the crystal being monitored every week, the crystal will have neat edges and good transparency.



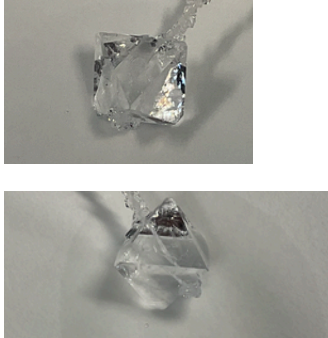
Method for Growing Alum Crystals:

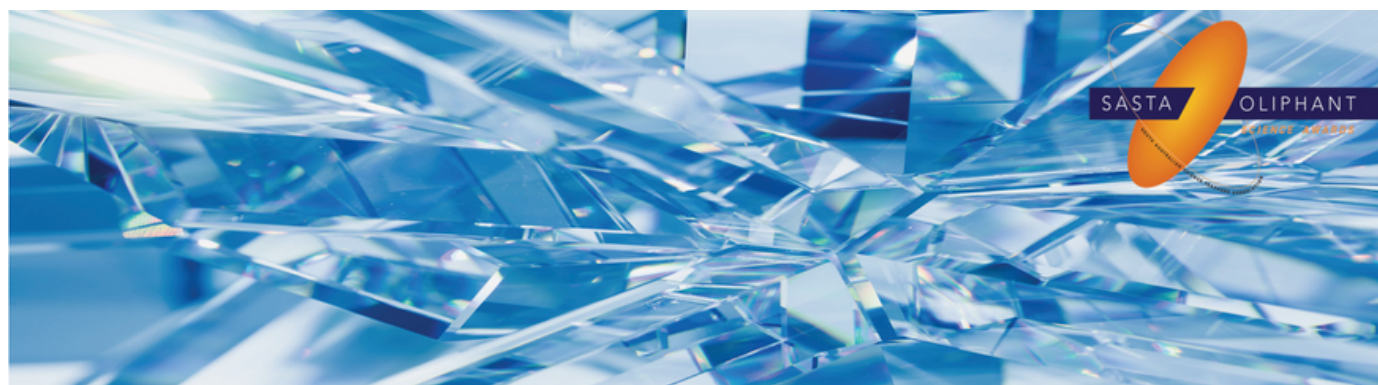
1. Place 10 grams (1 tbsp) of alum into a clean 250 mL beaker, and add 70 mL of water.
2. Heat the beaker to approximately 60°C. Stir until all alum is dissolved, and let it stand for a few minutes if it is cloudy.
3. Gently pour the solution into a separate, clean 250 mL beaker. Briefly heat the mixture to dissolve all alum crystals if necessary.
4. Tie a piece of thread to a pop stick and place in the solution, making sure some part of the thread is submerged.
5. Take a piece of filter paper and cut a slit into the centre of it. Slide the pop stick into the cut, making the pop stick and filter paper are interlocked. Place the filter paper and pop stick onto the beaker and store in a water bath in the incubator at 24°C. Crystals should form on the submerged part of the thread and/or at the bottom of the beaker, within a few days, or by the end of the week.
6. Remove the thread after a few days. Remove all of the crystals apart from the best crystal (a defined octahedral shape) and tie a fine thread around it. Keep the rest of the crystals should the crystal be damaged.
7. Wrap the thread of the best crystal around a pop stick. Fit the pop stick into a piece of filter paper, just like in step 5. Place the filter paper setup on the beaker, making sure the crystal is fully submerged in the solution. Place it in the water bath, and filter the solution/make more solution weekly.




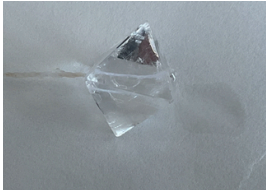
Method to Filter the Solution:

1. Take the beaker with the crystal out of the water bath. Take the crystal out from the beaker and put it to a side.
2. Grab a funnel, large filter paper and a new beaker. fold the filter paper 2 times and place it in the funnel, and place the funnel into the new beaker.
3. Using the old beaker, pour the solution into the funnel and wait for it to be filtered. Take some photos of the crystal while the solution filters.
4. Take the old beaker, and with a spoon, scoop all the crystals that formed at the bottom into the new beaker.
5. Now the solution is filtered. Clean the bench and put the crystal into the solution, making sure it is submerged.
6. Put the beaker with the crystal back into the water bath.



Date/Time	Description of what the student did, problems encountered and solved.	Crystal Characteristics	Photos
22-5-24 9 AM - 10 AM	I started by doing step six of the method, picking the best crystal in terms of clarity and cuts from the thread. I tied it to a fine thread, tied the thread to a pop stick and put it aside. Next, I filtered the solution. Fortunately, this week, there were no problems I faced and everything was straight forward.	The crystal had amazing clarity with no clouding in the centre. This was accompanied by neat edges and no overgrowth on the faces.	
29-5-24 9 AM - 10 AM	This week, there was nothing to do apart from filter the solution. I did not run into any problems during this, apart from some slight overgrowth on the crystal, which I plucked away with the use of some tweezers.	Great clarity and neat cuts. Some overgrowth on the end, but this was plucked away.	
5-6-24 9 AM - 10 AM	This week, I filtered the solution and did not run into any problems, apart from slight overgrowth on the thread, which was taken away.	Some slight clouding has begun in the centre, but apart from that, the crystal was still amazing, existing with great cuts.	



Date/Time	Description of what the student did, problems encountered and solved.	Crystal Characteristics	Photos
12-6-24 9 AM - 10 AM	This week, I filtered the solution. There were no problems faced and no overgrowth either.	Apart from the same cloudiness as the previous week, there was no more clouding this week. This was accompanied by the crystal having great edges.	
19-6-24 9 AM - 10 AM	This week was the same as last week. I filtered the solution, and there was a slight overgrowth on the thread, which was taken away by the tweezers.	Very minor clouding in the centre, neat edges, some overgrowth on the thread.	
26-6-24 9AM - 10AM	This week, I filtered the solution and did not run into any problems, apart from slight overgrowth on the thread, which was taken away.	Small clouding in the centre, but apart from this, great clarity and cuts. Very minor overgrowth on the thread.	
3-7-24 9 AM - 10 AM	This week, all I had to do was filter the solution, and did not run into any problems, as there was no overgrowth on the crystal or thread.	Same clouding in the centre as all previous weeks. This is accompanied by neat edges.	

CRYSTAL INVESTIGATION:

Conclusion:

Throughout this project, my crystal has had great clarity and amazing cuts, and therefore, the hypothesis has been supported, as the crystal was monitored every week, and necessary changes were made.