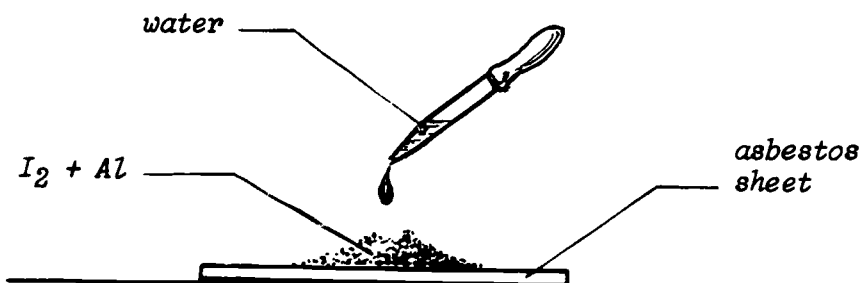


5.18. THE FIERY WATER

- Materials:
1. An asbestos plate or evaporating dish.
  2. A medicine dropper, mortar and pestle.
  3. Aluminum powder and iodine crystals.

CAUTION !

PERFORM UNDER FUMEHOOD OR OUTDOORS !



Procedure:

1. Grind the iodine crystals (about a teaspoonful) in the mortar.
2. Take about the same amount of aluminum powder (make sure that the aluminum powder is dry, otherwise heat in oven before using).
3. Mix the two dry powders on the asbestos sheet or in the evaporating dish with a spatula and make a small indentation in the heap.
4. Place the asbestos plate or evaporating dish under an exhaust hood or outdoors, and add just one drop of water to the mixture of powders (use the medicine dropper).
5. Stand back and observe!

Questions:

1. Why do the iodine crystals have to be finely ground?
2. Why do the reagents have to be dry?
3. What function does the water have in this reaction?
4. Would the two substances react without the water?
5. Where in daily life does water speed up a reaction like this?

Explanation:

The iodine crystals have to be ground first to increase the contact surface between the two reagents. Smaller particles have a much larger surface area than the relatively larger crystals. If the aluminum powder is damp, the reaction may not succeed too well, because the moisture might take away the released heat needed to initiate the reaction. The water's function is that of a **catalyst**, which brings the molecules of the reagents even closer together. Heat is evolved from the first few molecules reacting, and this heat sets off the rest of the reaction.

In our daily life, water speeds up the rusting process of metals when left in the damp outdoors, like bicycles, nails, etc.