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Assignment: Preparation of 250 ml 0.5 M $Na_2SO_4.\ 10H_2O$
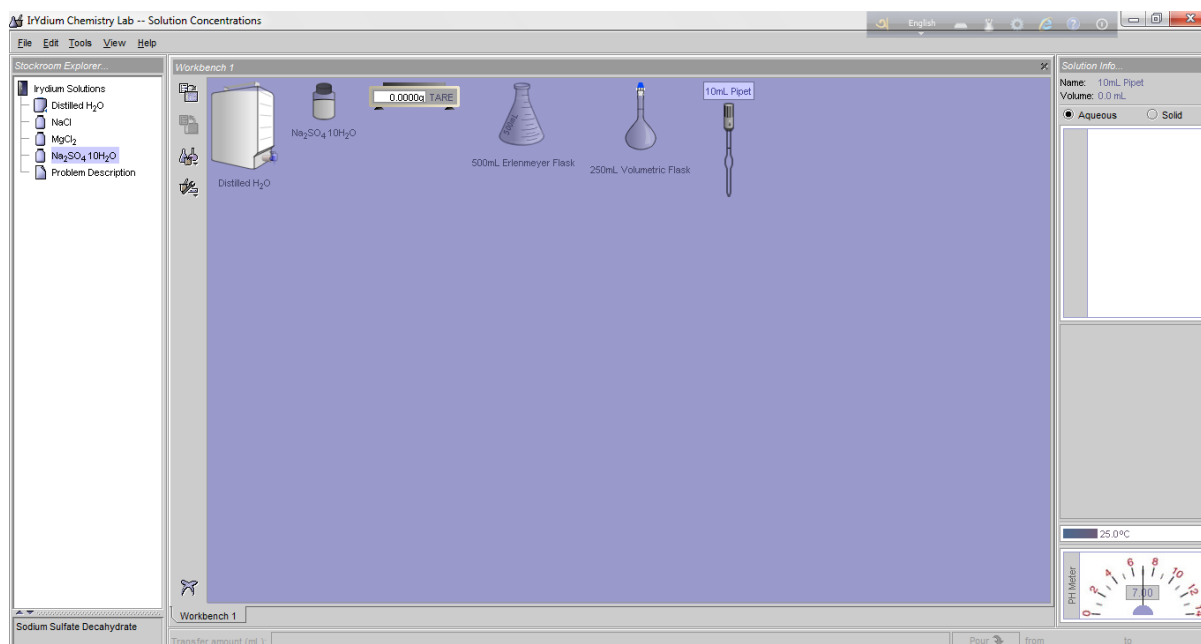
Calculation:

1000 ml 1 M solution contains 322.17 gm $Na_2SO_4.10H_2O$

So, 250 ml 0.5 M solution contains $\dfrac{322.17 \times 250 \times 0.5}{1000}$ gm $Na_2SO_4.10H_2O$
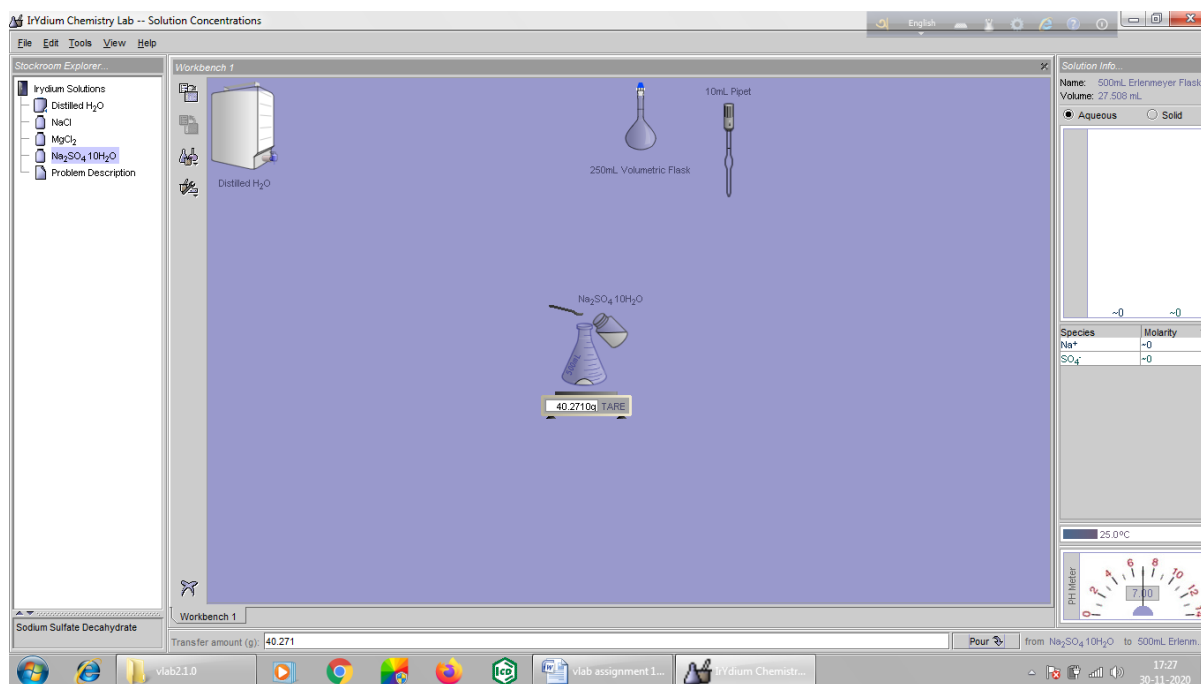
= 40.271 gm $Na_2SO_4.10H_2O$

Apparatus and reagents: 500 ml Erlenmeyer, 250 ml volumetric flask, 10 ml pipette, scale, distilled water, solid $Na_2SO_4.10H_2O$.

Procedure:

To perform the experiment we have to open vlab interface. Then from file menu we have to double click and open load homework and then have to select molarity and density and from the sub menu we have to open Making solutions from solid. The workbench and stockroom explorer opens. In the stockroom explorer we have to double click on distilled water and $Na_2SO_4.10H_2O$ so that these will be added to workbench. Then we have click on select tools and from the dropdown menu we have to select scale so that scale is added to workbench. Next we have to click on select glassware and from the dropdown menu we select Erlenmeyers and from sub menu 500 ml Erlenmeyer flask is selected and added to workbench. Then again we have to click on select glassware and from the dropdown menu we select volumetric flask and from the sub menu we select 250 ml volumetric flask and add to workbench. Again we double click on select glassware tab and from menu select pipette and from sub menu select 10 ml pipette.
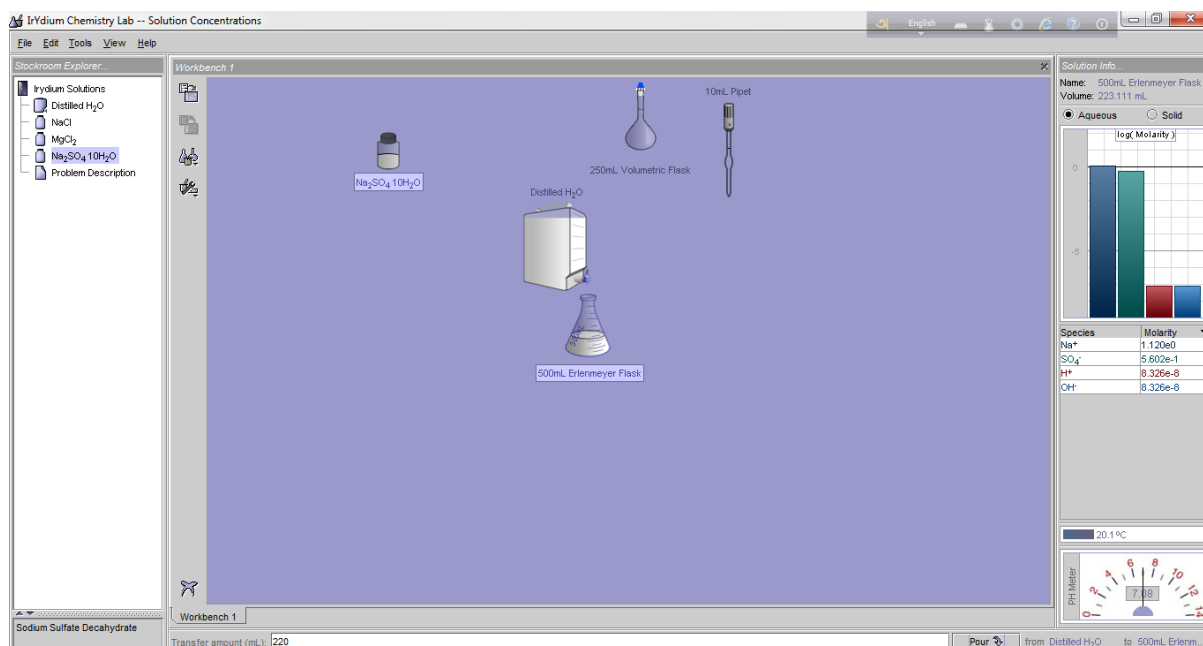
Next, we have to drag and place the scale to middle portion of workbench. Then we drag the 500 ml Erlenmeyer on the scale and we release it when a green plus sign appears. Then the weight of Erlenmeyer is shown in the scale (265.131 gm). We click on tare so that the scale now reads 0.000 gm. Then we drag the bottle of $Na_2SO_4.10H_2O$ on Erlenmeyer and release when green plus sign appears. In the transfer amount text bar at the bottom we type 40.271 and then click on pour tab so that 40.271 gm $Na_2SO_4.10H_2O$ is transferred to the volumetric flask.
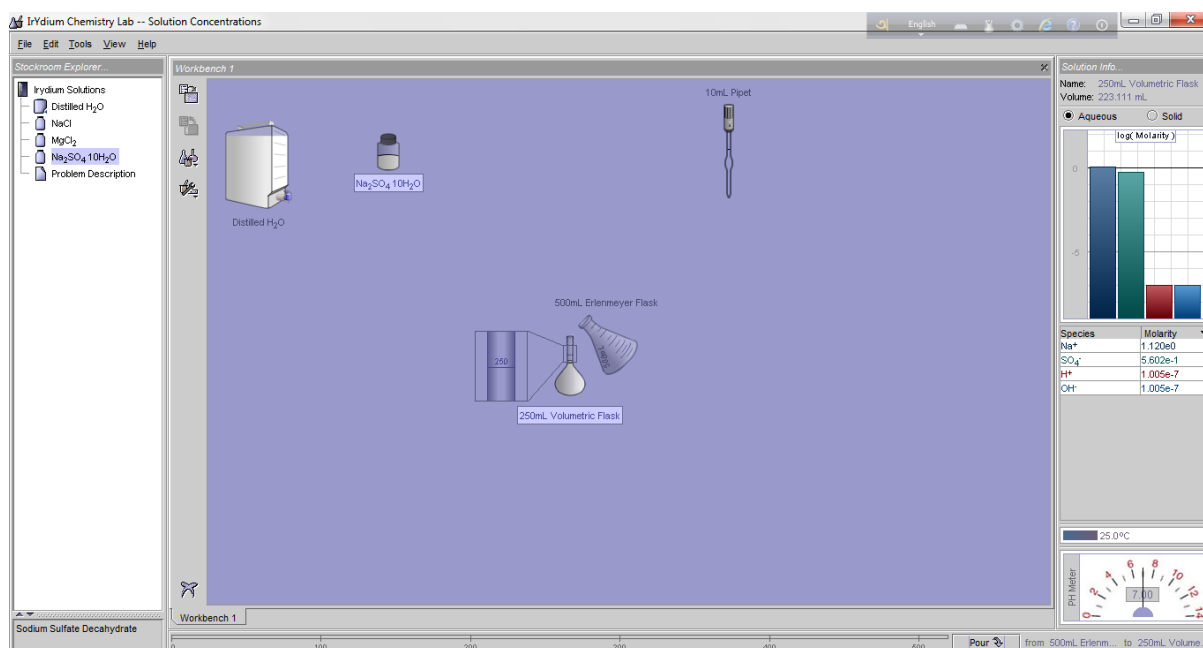

Then $Na_2SO_4.10H_2O$ bottle is drag to its previous position. We place Erlenmeyer to some other position. To remove the scale from workbench, we select Scale and then click on

delete. Then we drag distilled water on Erlenmeyer flask. We type 220 on the transfer bar below and click on pour to add 220 ml distilled water to Erlenmeyer.
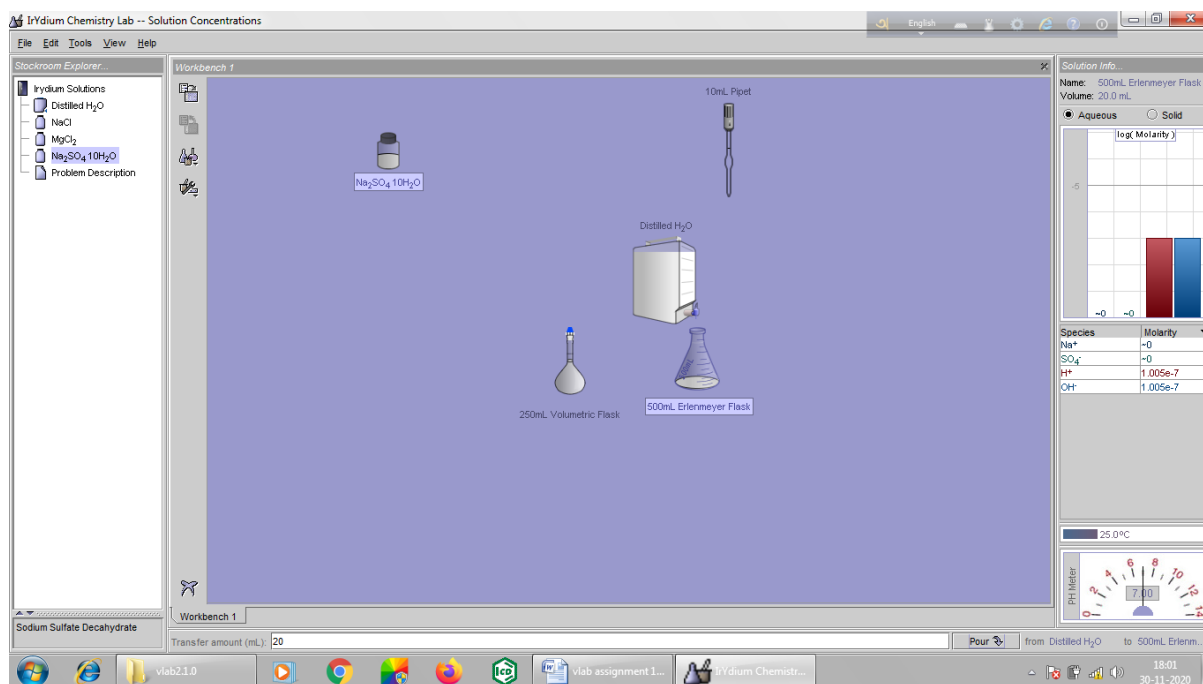

Then we drag and place the distilled water to a corner. We drag the volumetric flask and place it at the side of Erlenmeyer flask. Then we drag and place Erlenmeyer flask on the volumetric flask and release when the green plus sign appears. To transfer the content we click on Tools tab and select transfer bar and from the sub menu we click on realistic transfer. Realistic transfer scale appears at the bottom of workbench. Then we click on pour button and hold the left mouse button to transfer entire amount.
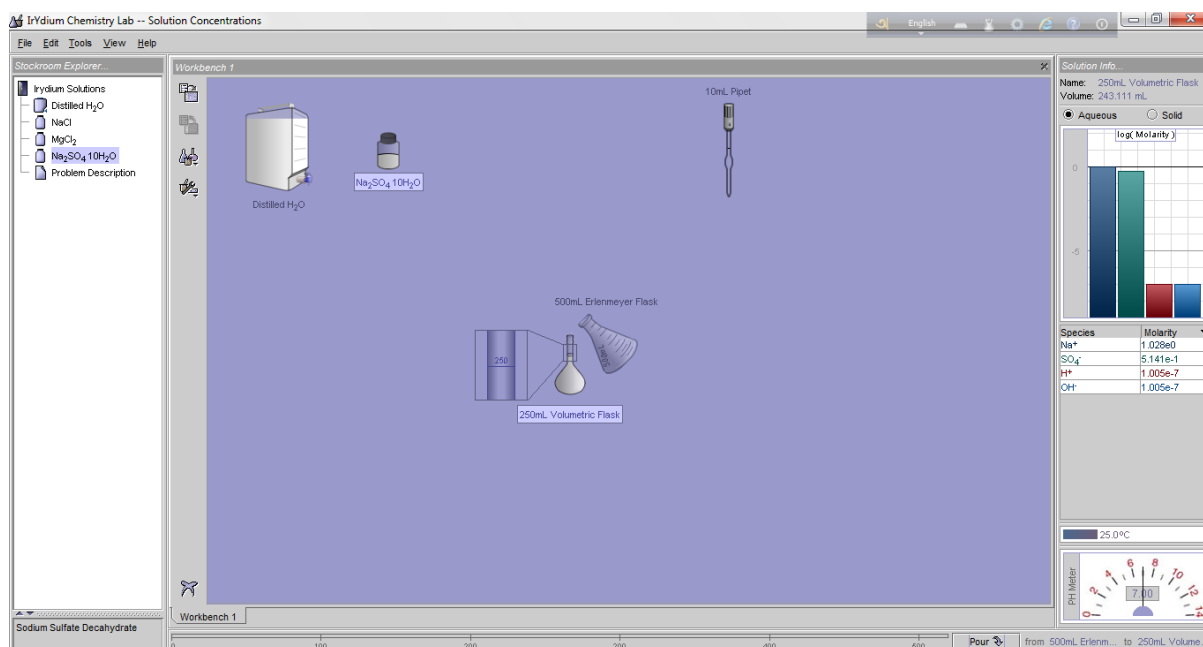

T o wash the Erlenmeyer flask we drag the distilled water on the Erlenmeyer flask. From the tools menu we select transfer bar and from the sub menu select precise transfer. In the

transfer bar below we type 20 and click on pour button. 20 ml distilled water is transferred into the Erlenmeyer flask.
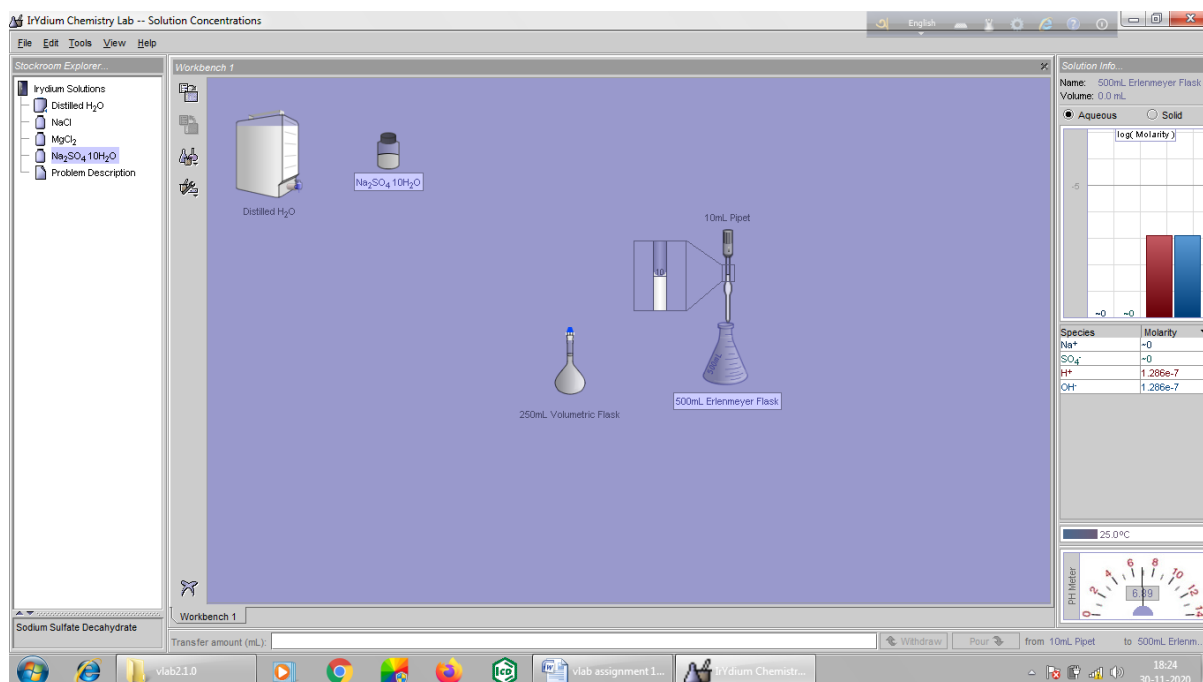

Next we drag the distilled water to other position. We place Erlenmeyer flask on the volumetric flask and release when green plus sign appears. From the tools bar we select realistic transfer and click on pour button and hold the mouse button till the entire amount is transferred to volumetric flask.

Next Erlenmeyer flask is placed in some other position of workbench. Distilled water tank is placed on the Erlenmeyer flak. From Tools tab we select precise transfer. In the transfer bar that appear at the below position of workbench we type 10 and then click on pour to

transfer 10 ml of distilled water. We remove distilled water tank. Then we bring the 10 ml pipette on the Erlenmeyer flask. We type 10 on the transfer bar and click on withdraw. 10 ml is withdrawn from Erlenmeyer flask into pipette.

Then we place pipette on volumetric flask. We change the transfer mode to realistic transfer from tools menu. We go on clicking the pour tab and the distilled water is gradually added from the pipette to the volumetric flask. When lower meniscus touches 250 ml mark we stop adding.

Finally the concentration of Na^+ shows 9.997×10^{-1} M and concentration of SO_4^{2-} shows 4.999×10^{-1} M.

So we have prepared 250 ml 0.4999 M $Na_2SO_4.10H_2O$ solution.