

What is going on?

When the tube are rotated, the centripetal force pulls the materials in the tubes towards the centre.

Materials that are denser have greater inertia and thus are less responsive to centripetal force. Hence they will be less pulled inward. As a result the denser items are found outside the circular path. In this case the SS ball remains at the top of the liquid inside the test tube. Where as the materials which are less denser will be pulled inward. As a result these are found near the center of the circular path, in this case the cork piece.

The centrifuge was invented in 1883 by Carl de Laval (1845-1913) a Swedish engineer who used it to separate cream from milk.



CENTRIFUGE MACHINE

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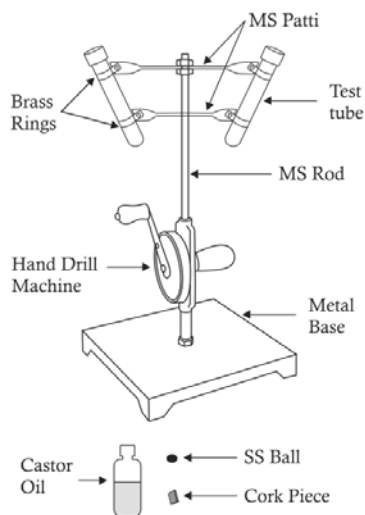
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CENTRIFUGE MACHINE

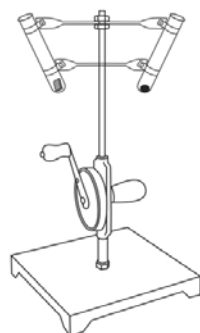
See how the machine separates heavier and lighter substances

Assembly :

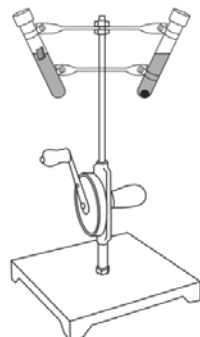
Consists of a hand drill machine fixed firmly on a metal plate (180 x 180 mm). An MS rod of dia 8mm and length 180 mm is fixed to the drill machine as shown in the diagram. Using two ms pattis and brass rings two plastic test tubes with cap are fixed to the 8 mm rod as shown in the diagram. One SS ball of dia 11 mm, a small cork piece and 50 ml castor oil are part of the kit.



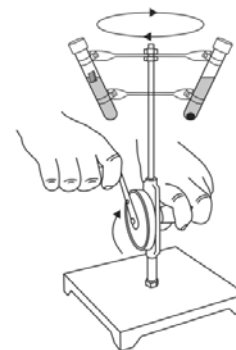
To do and notice :



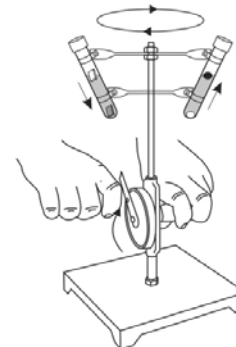
Step 1 : Place SS ball and cork piece in each test tube as shown above.



Step 2 : Now pour castor oil in each test tube to 3/4 level and close the test tube with cap as shown above.



Step 3 : Rotate the drill machine by using its handle as fast as possible for about a minute and then stop. What you observe now?



When the axis is rotated, you will observe that the ball rises as might be expected but the cork sinks. This is clearly seen when you stop rotating the model.