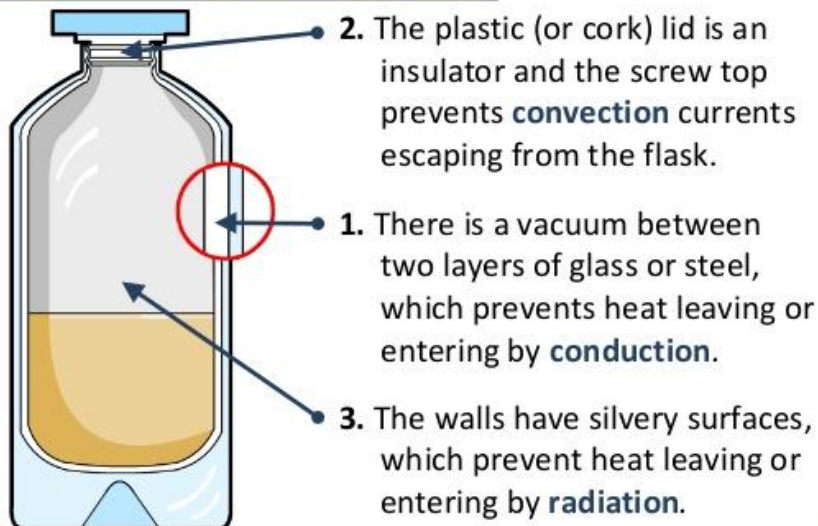


Thermos Flask

Sir John Dewar studied how gases could be turned into liquids. Liquid oxygen has a boiling point of -182.9°C . When the liquid oxygen was made it needed to be stored in a container that would prevent heat from the surroundings entering and causing the liquid to boil. In 1892, Dewar invented a flask called a Dewar flask that allowed him to keep the liquid oxygen cool for his experiments. The Dewar flask is now widely known as the thermos flask and is mainly used to keep drinks hot.

Energy Transfer by Heating

How is a vacuum flask able to keep hot drinks hot and cold drinks cold?



A thermos flask or a vacuum flask is used to keep a hot liquid hot and a cold liquid cold for a long time, by preventing the loss or gain of heat energy due to conduction, convection and radiation.

The thermos flask consists of a double-walled glass vessel resting on a cork inside a metal or plastic case. The outer surface of its inner wall and the inner surface of its outer wall are silvered. This prevents heat transfer due to radiation. The space between the two walls is separated by vacuum and the walls are sealed at the top. The double-walled glass vessel and vacuum prevents heat loss by conduction. The insulating stopper or cork at the top minimises heat loss by convection and evaporation in the air above the surface of the liquid.

Vacuum flasks are used at home, and in laboratories and industries to store liquids that become gases at low temperatures.

Video link:

<http://www.learnnext.com/ICSE-Class-VII-Physics/Lesson-Thermos-Flask.htm>

Answer the following questions:

1. What creative thought did Dewar have when thinking about studying liquid oxygen?

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2. What evidence from the work of others did he use in designing his flask?

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3. Which forms of energy transfer does the vacuum prevent?

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4. How would the efficiency of the flask be affected if the walls were painted black? Explain your answer.

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5. How could a warm liquid lose heat if the stopper was removed? Explain your answer.

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