

Ice Melting Blocks

Equipment:

square aluminum block (painted black)
square high density foam block of the same size (painted black)
two rubber O-rings

“Chemicals”:

crushed ice or ice cubes

Safety:

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Procedure:

Both blocks have the same temperature (room temperature). Nonetheless, the aluminum block feels cool whereas the foam block feels warm. The O-rings are put on the blocks and subsequently, a little bit of crushed ice or an ice cube is placed in the middle of each block.

Observation:

The ice on the aluminum block melts much faster.

Explanation:

Aluminum as a metal is a very good entropy conductor, high density foam, however, a very bad one. The entropy flow by conduction always takes place in the direction of a temperature drop. Therefore, the (warmer) aluminum transfers entropy to the (colder) ice, which begins to melt as a result. The aluminum block feels cool at the beginning for the same reason. Entropy flows from the (compared to room temperature) warmer hand to the aluminum block. This loss of entropy makes the skin feel cooler. However, the high density foam as a bad entropy conductor transfers nearly no entropy.

The O-rings on the blocks should prevent the water from flowing off.

The same principle is used by the so-called “fast defrosting trays” for frozen food such as meat.

Disposal:

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