

PRACTICAL EXPERIMENT 2 - PAPERCLIP TEST

Practical Experiment is an alternative to the Penny Test (Practical Experiment 1) in identifying the surface tension of water and how it is altered by EndoTherm.

Difficulty: Low
Time Required: 10 minutes

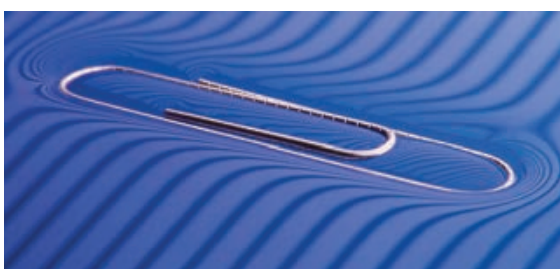
Equipment Required:
A flat, level surface
1 pipette
1 glass of tap water
1 bottle of EndoTherm solution

Note:

EndoTherm test solution is available as part of the Eco-Schools resource pack please contact EndoTherm to request it. Washing up liquid can also be used as an alternative to mimic the EndoTherm effect in the practical experiments in the classroom. Washing up liquid is not a substitute for EndoTherm and should NOT be dosed into a heating system under any circumstances.

PROCEDURE

1. Fill the glass about $\frac{3}{4}$ full with water and lay on flat surface.
2. Carefully lay the paperclip on the surface of the water. Do not drop from a height as the gravitational force will pierce the surface tension.
3. What did the paperclip do? Did it sink? Did it float? If done correctly the paperclip will have floated. You can also identify the surface tension holding the water afloat (see picture below).
4. One drop at a time, drop the EndoTherm solution into the water. What happens? After a few drops of water (dependent on the volume of the glass) the surface tension should break down and the paperclip should sink to the bottom.
5. If you have time, why not try different materials instead of the paperclip and different liquids to see if they allow the paperclip to drop as quick as EndoTherm.



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OBSERVATION AND RESULTS

Each molecule of water has an attraction to another molecule. This attraction is strong and causes a skin like layer on the surface of the liquid which is called Surface Tension. This tension is strong enough to hold the paperclip. When you put the EndoTherm solution into the water it weakens these bonds and the surface tension is no longer strong enough to support the weight of the paperclip. The paperclip falls into the water.

