



The Magical Teapot

Engage



For my last birthday my mother gave me a beautiful porcelain teapot. She told me it is authentic porcelain from China. As you might know, porcelain is very fine, half transparent and very strong. Porcelain is often called "China" as it originates from China. Porcelain has been manufactured in China for over two millennia. In Europe manufacturing began only in the 18th century and BTW, one of the most famous European porcelain centres is in Delft not far away from Leiden.

When my mom gave me the teapot, she said it was real and authentic; She was waiting for the right moment and felt that now on my 50th birthday I could carry on the token. According to my mom, the teapot has been with our family for generations, going back to Marco Polo's visits to China, and that it possesses magic qualities. "Yeah right! Magic Shmagic!" was my reaction. Well, I don't really believe in magic, so I just put it in the cupboard and forgot about it for a few months.

Last Saturday we had important guests for dinner, and I thought it would be nice to serve tea in mom's teapot, that one with the "magic".

Well, I don't really believe in magic, nor in old wives tales, so I took it out of the cupboard and brewed fresh herbs, and this is what happened:

DEMONSTRATION

Explore



1. Place 5 drops of 1M NaOH solution in a clear cup (CUP A).
Add 1/3 cup of tea from the magic teapot.
What color is the resulting solution?
2. Place 5 drops of 1M HCl solution in a clear cup (CUP B).
Add 1/3 cup of tea from the magic teapot.
What color is the resulting solution?
3. Pour 1/3 cup of tea from the magic teapot into an empty clear cup (CUP C).
What color is the solution?
4. Pour the content of CUP A into CUP B.
What color is the resulting solution?



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Explain



1. Do you still think it was magic?
2. Read about the nature of indicators. Can you explain your results?
3. Can you conclude what colour is associated with acid and what colour appears in basic solutions?

Extend



1. Add all kinds of household materials (salt, soap, washing powder, lemon juice etc.) to the red cabbage solution.
Use very small amounts of each substance to start with.
Record your results.
2. Add larger amounts of the material to the same amount of red cabbage solution.
How does it affect the colour?
3. Add different amounts of red cabbage solution to one of the samples.
How does it affect the colour of the solution?
Can you explain these results?
4. Prepare a table to report your results.
Which of the household materials produce acidic solutions and which basic solutions?

Evaluate



Report your results and conclusions.

