Testing the strength of natural polymers

Education in Chemistry
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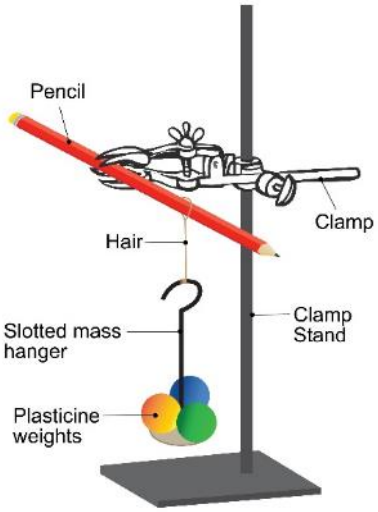
This experiment accompanies the above article 'Body, heal thyself'

Aim

Hair contains a natural polymer called keratin.
In this experiment we will compare the strength of single strands of hair with single strands of synthetic hair from a wig or hairpiece.



Apparatus

- Clamp and stand
- Pencil
- Hair and wig samples
- Slotted masses
- Plasticine
- Access to a balance

Method

1. Set up a clamp stand and clamp a pencil horizontally as shown in the diagram.
2. Prepare 10 pieces of plasticine to use as weights; each should be the size of a large marble.
3. Tie a knot in your hair sample and hang the loop over the pencil. Record the sample name, colour and whether it is human or synthetic, dyed or undyed in your table.
4. Hang the first slotted mass off the loop of hair.
5. Now add pieces of plasticine to the mass, one at a time. Do this until the hair breaks.
6. Weigh your masses and plasticine on the balance and record the result in your table.
7. Repeat this for all the hair samples.

Results

Sample	Colour	Human/Synthetic	Dyed/Undyed	Mass added to break (g)
1				
2				
3				
4				
5				
6				

Conclusion

Write a conclusion for your experiment. A really good conclusion also uses quotes from the results to support its claims.

Questions

1. Why can this data not be presented in graphical form?
2. Why does the size of the hair loop not matter? (Clue: think about the stress point on the hair)
3. Is there any correlation between hair colour or hair dye and strength?
4. Are you able to make a clear conclusion about the strength of the natural polymer in hair and the synthetic hair? Explain your answer.