Transition metals & nanoparticles

Reading : 23 and 38-39

Knowledge

1. Where are the transition metals found?

2. Why are they not in a group?

3. What is a 'nanoparticle'?

4. What are the two categories of nanoparticles?

5. Suggest how many atoms would be contained in a nanodiamond.

6. Give two uses of transition metals

7. Give two uses of nanoparticles

8. What property does silver only have as a nanoparticle?

Application

1. Describe three physical properties that are 'typical' of the transition metals

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2. Why do nanoparticles have different properties than the same substance in larger pieces?

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3a) The diameter of an atom is $1x10^{-10}$ and the diameter of a fine nanoparticle is around $1x10^{-7}$. What is the difference in size of the two?

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3b) How many orders of magnitude is this?

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4. Transition metals are often used as catalysts. Give two advantages of using nanosized particles of the metal.

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5. Describe one concern that scientists have about using nanoparticles

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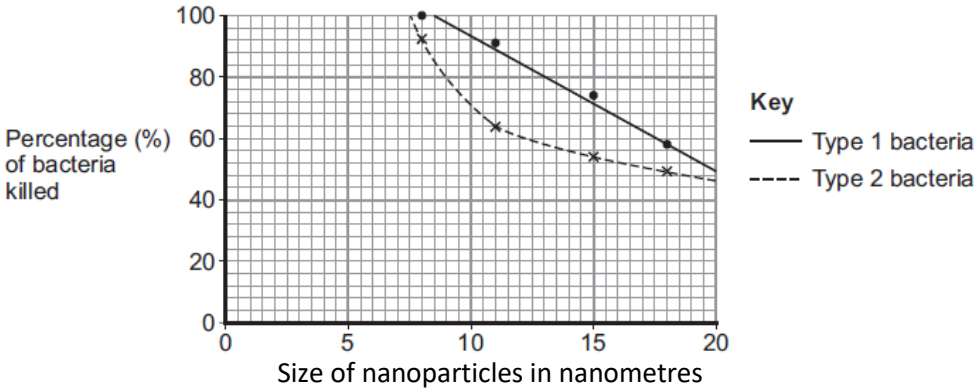
6. Magnesium oxide nanoparticles can kill bacteria.

The figure below shows the percentage of bacteria killed by different sized nanoparticles.



(a) (i) Give **two** conclusions that can be made from the figure above.

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(ii) Points are plotted for only some sizes of nanoparticles.

Would collecting and plotting data for more sizes of nanoparticles improve the conclusions?

Give a reason for your answer.

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7. Compare the properties of the transition metals with those of the metals in Group 1

Remember, 'compare' means what is the SAME and what is DIFFERENT. Don't forget to do both!

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