Dirty stirrer bars can act as phantom catalysts

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Magnetic stirrer bars are a useful tool in any chemistry lab. However, contaminated stirrer bars could be ruining experiments that are extremely sensitive to the presence of tiny amounts of metal catalysts.

Stirrer bars are normally used for several months or years because their coating – usually PTFE – is inert and they can be cleaned many times. However, scientists have shown that the bars' surfaces are more easily damaged and contaminated than previously thought. Spectroscopy showed the presence of metal nanoparticles – palladium, platinum, gold and others – on used stirrer surfaces. Some chemical reactions can be catalysed by traces of metals. Therefore the leftover metal on a stirrer bar from one reaction could catalyse another experiment. They recommend running control experiments with unused stirrer bars to solve the problem.

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1. What is a catalyst?
2. Transition metals are good catalysts. Give two other properties of transition metals.
3. Explain why using a control experiment with a new stirrer would be useful.
4. Explain why tiny amounts of metal nanoparticles can act as an effective catalyst.