Question #62182, Chemistry / General Chemistry

Question:

Outline a laboratory method to prove whether or not an old silver dollar is really made out of silver.

Answer:

Put a drop of reagent of potassium hydroxide on the surface of the coin of old silver dollar. As a result silver oxide is formed on the drop place:

$$2AgNO_3 + 2KOH \rightarrow Ag_2O \downarrow + H_2O + 2KNO_3$$

To remove the black coating from the coin put the water solution of ammonia. The Tollens solution is formed:

$$Ag_2O\downarrow + 4NH_3\cdot H_2O \rightarrow 2[Ag(NH_3)_2]OH + 3H_2O$$

or put the nitric acid to dissolve the silver oxide:

$$Ag_2O\downarrow + 2HNO_3 \rightarrow 2AgNO_3 + H_2O$$

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