Answer on Question #43330-Physics-Other

A light metal coated ball is suspended by means of a slick thread. When a charged insulated rod is brought near the ball, the ball is first attracted and then after touching the rod, is repelled from it. Explain.

Answer

For example let insulated rod is charged negatively.

If the negative rod is brought near an isolated, neutral ball, the ball will be polarized. In the ball, electrons are free to move through the material, and some of them are repelled over to the opposite surface of the ball, leaving the surface near the negative rod with a net positive charge. The ball has been polarized, and will now be attracted to the charged rod.

After touching the rod the previously neutral ball acquires the same type of charge as the charged rod (in our example - negative). This is a case of charging by conduction.The charge rod maintains the same type of charge that it originally had. So in this case, both objects have a negative charge and repel each other.