

## "Floating" Styrofoam Spheres

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I recently came across an interesting, inexpensive electrostatics "trick" that uses small Styrofoam spheres (~ 4 to 5 mm in diameter)<sup>1</sup> and a small clear plastic ziplock sandwich baggie. Fill the baggie about one-quarter full and zip it closed (see photo). Leave enough air inside so that the walls of the bag are separated by about an inch (like a small pillow). Place the bag between the palms of your hands and rub vigorously, making sure to rub a good portion of the spheres with the sides of the baggie. The friction between the spheres and the bag causes a charge separation. The charged spheres appear to float as they cling to the sides of the baggie and repel each other.

Holding the bag in front of you and lightly shaking it up and down gives a "bubbling" effect. Dipping your finger inside the bag will cause the charged spheres to cling as they locally polarize the atoms in your finger. Are the spheres charged positively or negatively? Have your students devise an experiment to determine this! Some of my students discovered that opening the bag and exhaling into it will neutralize the system, making it difficult to create the effect again right away. Leaving the bag open for awhile will dry the spheres so that they can be charged again later.



**The bag on the left contains smaller spheres (~2 mm in diameter) and the bag on the right contains larger spheres.**

### Acknowledgments

Many thanks to Roy Lewis for taking the photo with his fancy new digital camera, and to Bob Butkus of Falcon Foam for his expertise on Styrofoam.

### Reference

1. Readers may find it difficult to locate a source for the spheres. I would be pleased to share from a large supply of the smaller spheres that was donated to me. Just send a self-addressed *padded* envelope with enough postage on it for me to send the lightweight spheres.