Students' Understanding of Particulate Nature of Matter

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ABSTRACT

Understanding of Particulate Nature of Matter is the foundation for learning chemistry. Chemistry curriculum in Senior School and higher education is extension of atomic theory. Appreciating this fact, atomic theory finds space in school science curriculum across the globe. Students in India study atomic theory in grade 9. However, this inclusion does not help much as students develop many alternative conceptions related to particulate nature of matter. The abstract nature of this topic makes it difficult for students to comprehend. Alternative conceptions related to particulate nature of matter impede understanding of chemistry. For teachers teaching grade 11, this is a challenge. Awareness of common alternative conceptions will help teachers design new strategies to scaffold students' understanding of atom. This paper is an attempt to identify common alternative conceptions associated with particulate nature of matter among students who opt for science in grade 11.

Keywords: Particulate Nature of Matter, Atomic Theory, Alternative Conceptions, Particles, Abstract

INTRODUCTION

"If, in some cataclysm, all of scientific knowledge were to be destroyed, and only one sentence passed on to the next generation of creatures, what statement would contain the most information in the fewest words? I believe it is the atomic hypothesis that *all things are made of atoms — little particles that move around in perpetual motion, attracting each other when they are a little distance apart, but repelling upon being squeezed into one another.* In that one sentence, you will see, there is an enormous amount of information about the world, if just a little imagination and thinking are applied."

The above statement by Richard Feynman describes the importance of atomic theory in science. Atomic theory is the foundation of science, thus the foundation of science education as well. For comprehending science whether it is chemical reactions, nuclear behaviour, chemical bonding, shapes of molecules; understanding the atom and its structure is indispensable. It is therefore not surprising that the atomic theory is an essential part of science curriculum across the globe. The need for learners to appreciate the particulate nature of matter drives the inclusion of the