



In an effort to provide timely updates of critical issues for the first responder and to keep hazmat safety foremost in your thinking, the hazmat office will provide these brief monthly primers. Please let us know of any future topics that are of interest to you.

RADIOACTIVITY

“HOW SMALL IS SMALL?”

You can't taste, touch, see or feel radioactivity, but that doesn't mean those very small particles and energy forms can't be harmful to you. As part of an overview in preparation for recert, just how small are they???

A “Mole” in chemistry is a unit for a set number of particles (atoms, molecules, etc). For example, the number of molecules in one mole of water is about;

6,000,000,000,000,000,000,000,000 molecules

Kind of hard to get your mind around this, isn't it? A couple of different examples may paint you a picture;

A mole of marbles stacked up tightly would cover the USA 70 miles deep!

But;

A mole of water molecules can be swallowed in one gulp!!!

Now let's look at the relative size of the basic forms of radiation that we can detect with the rad meters that we carry on our apparatus:

ALPHA This particle is made up of the building blocks in the center of all atoms, namely **protons** and **neutrons**. These two particles are about the same size and if they were the size of bowling balls, the **Alpha particle** would be the size of **4 bowling balls**.

BETA This particle is made up of the small particles orbiting all atoms much like planets orbit the sun and are called **electrons**. Compared to the size of the Alpha particle above, this atomic particle is about the size of **one BB pellet**.

GAMMA Actually, this form of radiation isn't a particle at all. It is a form of wave energy and is very powerful.

What can we learn from these facts about atomic particles? For one thing, the relative size of these particles is still large compared to the mass of atoms clustered together making up your body and other simple materials. In other words, both **ALPHA** and **BETA** particles cannot ever get past the barrier of your outer layer of skin. In fact, the best protection from these radiation particles for the first responder in the field is to don **turnouts**. After decontaminating **turnouts** with soap and water, we can rest assured that this radiation will not harm us.....that is as long as we don't allow it to get *inside* our bodies.....**wear your SCBA's**!!!!!!!

If you have any questions, call Grant Coffey at 823-3946.

Drill Code: 86-08.01 B, C and D