Atomic target practice lab answers

How would the outcome of the scattering test have been different if the marble speed had been faster or slower? How would the outcome of the scattering test have been different if the marble speed had been faster or slower? The speed of the marble must be fast enough to pass through to the other side of the board if the target is not in its way, or bounce back out from under the cardboard if it hits the object.

Why do some of the alpha particles bounce back from the target? The particles that bounce back do so because they have the largest initial energies. These particles haver nuclear interactions with some of the target nuclei. The final direction of motion is determined by accumulation of collisions.

In what ways does this experiment simulate Rutherford's efforts to determine the structure of the atom? Final answer: The Rutherford Scattering simulation provides an education tool to understand the atomic structure by reenacting Rutherford's gold foil experiment, simulating the deflection of alpha particles by atoms to indicate a dense nucleus contrasting the 'plum pudding' model.

What is an atom mostly made of? Most of the atom is empty space. The rest consists of three basic types of subatomic particles: protons, neutrons, and electrons. The protons and neutrons form the atom's central nucleus.

What were the results of the scattering experiment? During Rutherford's ?-particle scattering experiment, he concluded that: (i) electrons have a negative charge. (ii) the mass and positive charge of the atom is concentrated in the nucleus. (iii) neutron exists in the nucleus.

What do the marbles represent in Rutherford's experiment?

What would cause the alpha particles to reflect backwards? This is because the alpha particles are positive and like charges repel each other, so the positive part of the nucleus deflected the alpha particles.

Why did some alpha particles deflect more than expected? a small number of alpha particles being deflected at large angles suggested that there is a concentration of positive charge in the atom - like charges repel, so the positive alpha particles were being repelled by positive charges.

Why do few alpha particles get reflected in an alpha scattering experiment? In an alpha scattering experiment, few alpha particles rebounded because the positive charge of the atoms had very little space.

How is the size of the nucleus estimated from the Rutherford scattering experiment? By shooting alpha particles of kinetic energy 5.5 MeV, the point of closest approach was estimated to be about 4×10-14m. Since the repulsive force acting here is Coulomb repulsion, there is no contact. This means that the size of the nucleus is smaller than 4×10-14m.

How did the atomic model change after Rutherford's experiment? Thomson's plum pudding model of the atom had negatively-charged electrons embedded within a positively-charged "soup." Rutherford's gold foil experiment showed that the atom is mostly empty space with a tiny, dense, positively-charged nucleus. Based on these results, Rutherford proposed the nuclear model of the atom.

What are the outcomes of Rutherford's gold foil experiment? Rutherford's gold foil experiment showed that atoms are mostly empty space, with the positive charge concentrated in a nucleus. He realized this because most of the alpha particles passed straight through the piece of gold foil, with just a few deflected at huge angles.

Is an atom 99.99 empty space? As a general rule of thumb, nuclei are about 100,000 times smaller than the atoms that they are housed in, making them practically empty space. When you start to consider that atoms are about 99% empty space and they make up 100% of the universe, you can start to see: you're made up of nothingness.

Which is larger, a proton or an electron? A proton is about 1835 times more massive than an electron. If you are asking about their physical dimensions - no one knows. Scientists currently do not know how small electrons are. They are smaller than we can currently measure and may not have a size at all!

What is smaller than an atom? Subatomic particles are particles that are smaller than the atom. Protons, neutrons, and electrons are the three main subatomic particles found in an atom. Protons have a positive (+) charge. An easy way to remember this is to remember that both proton and positive start with the letter "P."

Why do atoms have no overall charge? Every atom has no overall charge (neutral). This is because they contain equal numbers of positive protons and negative electrons. These opposite charges cancel each other out making the atom neutral.

What is the same for all atoms of the same element? Atoms of the same element always have the same number of protons, same Z, but often have different numbers of neutrons, therefore, different mass numbers.

What do electrons do around the nucleus? An electron orbiting a nucleus is electrically attracted to the nucleus; it's always being pulled closer. But the electron also has kinetic energy, which works to send the electron flying away. For a stable atom, these two are in balance.

Why did Rutherford use gold foil? Rutherford used gold for his scattering experiment because gold is the most malleable metal and he wanted thethinnest layer as possible. Thegoldsheet used was around 1000 atoms thick. Therefore, Rutherfordselected a Gold foil in his alpha scatttering experiment. ... Extremly thin gold foil.

What if Rutherford had fired neutral particles? The results would not change; most particles would have passed through the foil undeflected, but a few would have been deflected at wide angles.

Why is Rutherford's experiment called the gold? Answer and Explanation: Rutherford's experiment was walled the gold foil experiment because he attempted to pass a beam of alpha particles through a thin sheet of gold foil.

What happens to the speed of a marble as it rolls down the ramp? Also, the final velocity of a marble after rolling down a ramp has a positive proportional relationship with the square root of the starting height of the marble. In other words, as you increase the starting height of the marble, the final velocity of the marble after rolling down the ramp increases quadratically.

Does the mass of a marble affect its speed? The more mass an object has, the harder it is to start moving, stop moving, slow down, speed up, or turn. Inertia is the tendency of an object to resist a change in its motion.

What results do you expect if a particle scattering experiment is repeated using a thin sheet of hydrogen in place of a gold foil explain? If ?? particle scattering experiment is repeated using a thin sheet of hydrogen in place of a gold foil, the scattering angle would not be large enough. This will happen because mass of hydrogen is less than the mass of incident ?? particle (around 4 times less).

What do you think would be the observation of if the a particle scattering experiment is carried out using a foil of a metal other than gold? If ?-particle scattering experiment is carried out using a foil of any metal as thin as gold foil used by Rutherford, there would be no change in observations. But since other metals are not so malleable, such a thin foil is difficult to obtain.

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