(a) i) A Wilson Cloud Chamber is used to distinguish between alpha decay and beta decay by expiering how alpha decay is able break down an atom ~~and Beta~~ mainly and ~~how Beta decay~~

ii) 218.00897 − 213.99981

= 4.00916

4.00916 − 4.002602

= 0.006558 × 931.5 MeV

Energy Released = 6.11064.

(b) i) $\lambda = 0.2\ nm$ $\quad m_n = 1.675 \times 10^{-27}\ kg$

Planck constant $(h) = 6.626 \times 10^{-34}\ Js$

$$\lambda = \frac{h}{mv}$$

$$0.2 = \frac{6.626 \times 10^{-34}}{1.675 \times 10^{-27}(v)}$$

$$(v)(0.2)(1.675 \times 10^{-27}) = 6.626 \times 10^{-34}$$

$$v = 2.0 \times 10^{-6}\ ms^{-1}$$

ii) The beam of neutrons is useful in determining the structure of materials as the neutrons themselves are able to determine through their speed and interference with the structure the shape of the material. Also, like xc-rays, they are able to determine the nature of the structure. Another reason is that the beam does not penetrate medal and they travel in a straight line so they can give a more precise scaling of the structure.

(c) The Bohr model of the atom was that electrons around the atom were always accelerating

The spectroscope aided Bohr and the development of the Atom as he was able to determine that electrons orbited the atom and that the atom was made up of protons and neutrons in order make the atom positive.

If you require more space to answer parts (a), (b) and (c) of the question, you may ask for an extra writing booklet.

If you have used an extra writing booklet for parts (a), (b) and (c) of the question, tick here. ☐

(d) i) Their conclusion was that they had ~~an~~ invented the idea of the neutron.

ii) The Rutherford-Bohr ~~was~~ model of the atom had other ideas implemented after the experiment that was that it was within the hydrogen - spectrum and that the electrons orbiting ~~the atom neutron~~ were not accelerating but were travelling in stationary states.

(e) The Three advances in knowledge ~~of~~ about particles ~~particle~~ and forces on the understanding of the atomic nucleus is the nuclear powerplants, the ~~Bom~~ atomic bomb and the use of Phosphorus in Agriculture

The nuclear powerplants are used to create efficient energy by using the atomic nucleus. That is that it undergoes many stages in order to keep ~~the~~ the powerplant controlled. They use ~~a~~ coolants in order to keep the nucleus cold and not heat up. There are other stages in order to keep the nucleus controlled.

Another advancement is the atomic bomb which is either uses uranium or plutonium in order to create an explosion. The explosion is created through the split second reaction of the uranium or plutonium experiencing fission as the ~~the~~ force immediately changes after the impact of the ground. This has had a negative impact on society explored in Hiroshima and Nagasaki.

Another advancement in knowledge of the atomic nucleus

is the use of Phosphorus in Agriculture.
The nucleus of Phosphorus is used in
order to observe the rate at which the
plants consume the fertilisers.

If you require more space to answer parts (d) and (e) of the question, you may ask for an extra writing booklet.

If you have used an extra writing booklet for parts (d) and (e) of the question, tick here. ☐

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