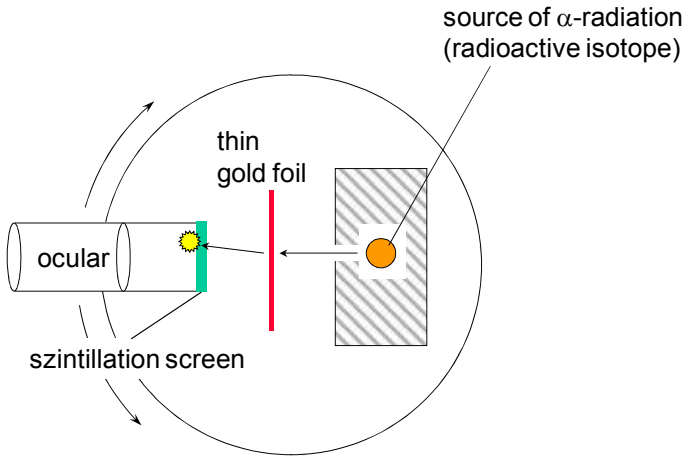
Exercises 2

1 Even Demokrit's atomic model may be useful to explain certain experimental results. Name an experimental observation which can be fully explained by Demokrit's idea about matter.

2 Why does Rutherford's experiment prove that the largest part of the atom's volume is empty space? Explain how Rutherford's atomic model was constructed from this observation.



3 Which of the following conclusions can be drawn based on the outcome of Rutherford's experiment (scattering of α-particles by gold foil)?*

a) Electrons are rotating in circles
b) Electrons are not moving at all
c) The volume of the nucleus is much smaller than the volume of the atom
d) The mass of the atom is concentrated in a very small center (nucleus)
e) There is almost no mass in the outer volume of the atom

4 Which experiment led Niels Bohr to the idea that each electron has a well defined energy at a given time, or, in other words, electrons occupy discrete energy levels?

5 Try to compare **Rutherford's atomic model** with **Bohr's atomic model** as closely as possible. Where are the similarities, where are the differences? Name an experimental observation which can be explained by Bohr's model but not by Rutherford's model.

* One or several answers may be correct. Please indicate appropriately by repeating the assignments a), b), c), … followed by the statements "right" or "wrong" on your answer sheet.