

122:5:120

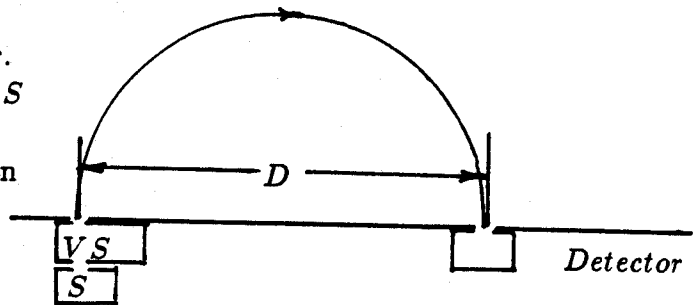
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Part I: The figure represents schematically a common type of mass spectrometer. Ions are produced in a hot vapor in source S and all those with a predetermined speed v pass through the velocity selector VS . Then they enter a uniform magnetic field B directed straight out of the page.



After traversing a semicircle of diameter D they either strike the the wall or pass through a narrow slit to the detector.

1. (3) Are the ions detected *positively* or *negatively* charged?

Answer questions 2 through 5 by indicating whether the mass of the ions detected *increases*, *decreases*, or remains the *same* when the specified change is made. Assume that after each change the original conditions are restored before the next change is made.

2. (3) The ion speed v is decreased.
3. (3) The magnetic field B is increased.
4. (3) The distance D to the slit is decreased.
5. (3) The temperature of the vapor in the ion source is increased.

