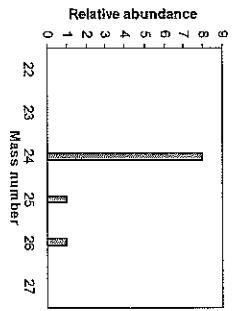
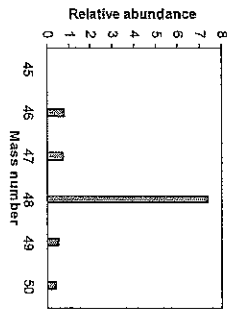


Sample Assessment Items for Mass Spectrometry

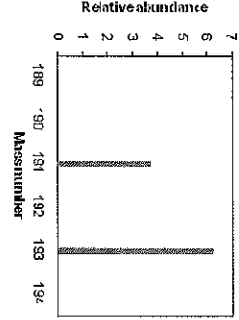
KEY



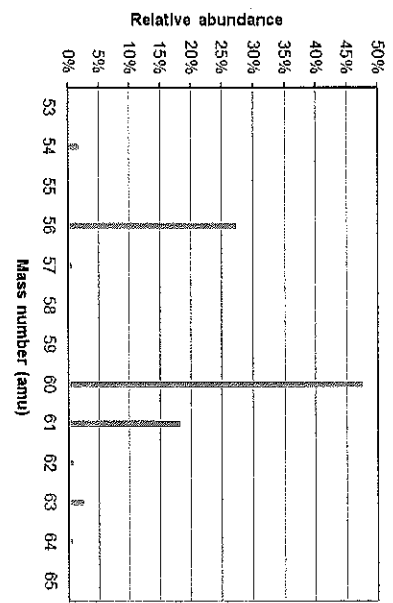
1. C What is the likely average atomic mass of the element with the adjacent mass spectrum?
- 23.0
 - 24.0
 - 24.3
 - 25.2
 - 26.0
2. C What is the likely element used for the spectrum?
- Na
 - Al
 - Mg
 - Be
 - Ca



3. B What is the likely average atomic mass of the element with the adjacent mass spectrum?
- 46.5
 - 47.8
 - 48.0
 - 48.9
 - 49.5
4. C What is the likely element used for the spectrum?
- Sc
 - V
 - Ti
 - Cr
 - Cr



5. C What is the likely average atomic mass of the element with the adjacent mass spectrum?
- 191
 - 191.6
 - 192.2
 - 193.0
 - 193.6
6. D What is the likely element used for the spectrum?
- Os
 - Re
 - Pt
 - Ir
 - Rh



7. _____ The elements Fe, Co, and Ni have average atomic masses that are close to each other, and these elements are often found mixed together. A sample that is believed to be a mixture is placed in a mass spectrometer, resulting in the data above. Which of the following true statements would be the best justification for concluding that the mixture contains Fe and Ni, but not Co?
- Fe, Co, and Ni all form 2+ ions, but Fe produces a 3+ ion more commonly.
 - Fe and Ni are more abundant in the universe than Co.
 - Co forms blue compounds in solution, so it absorbs different colors than Fe and Ni, which can both form yellow and green compounds.
 - Fe has a higher ionization energy than either Co or Ni.
 - E Co has only one isotope with 32 neutrons.
 - Co is more dense than Fe and Ni.

* Question states that all answers are true and then asks for the "Best" justification for explaining that Co is NOT in the mixture

Answer: E

If Co had isotope with 32 neutrons then the mass would be 59 amu and that would be the only peak. Since there is not a peak at 59 amu then we can assume no Co is present