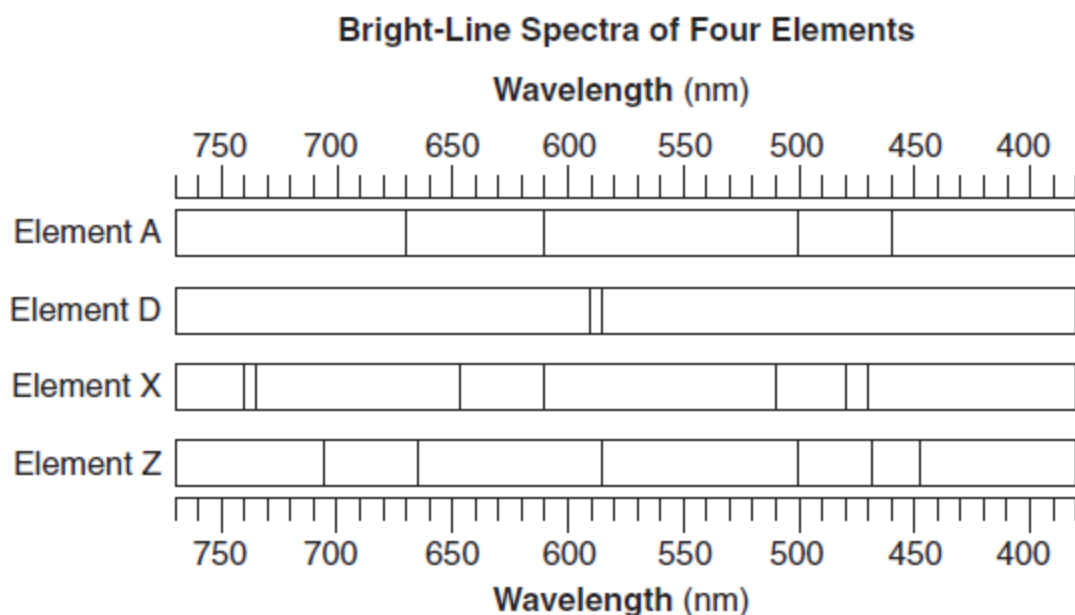
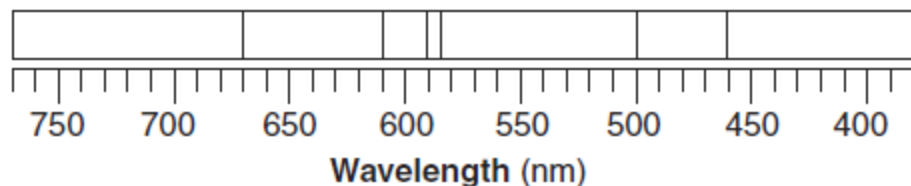


- A specific amount of energy is emitted when excited electrons in an atom in a sample of an element return to the ground state. This emitted energy can be used to determine the
 - mass of the sample
 - volume of the sample
 - identity of the element
 - number of moles of the element
- The bright-line spectra produced by four elements are represented in the diagram below.



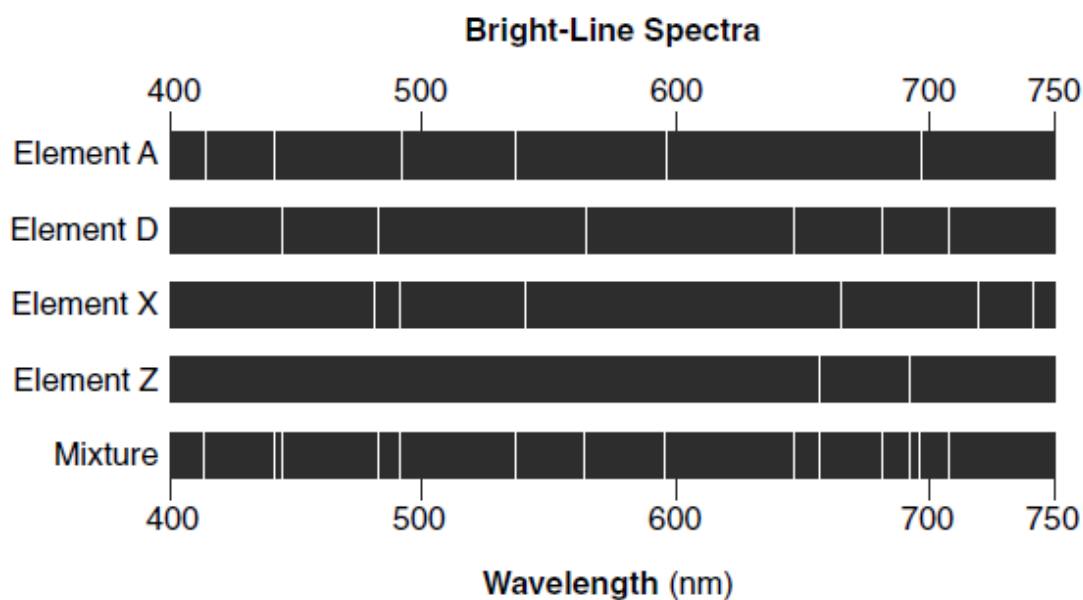
Given the bright-line spectrum of a mixture formed from two of these elements:



Which elements are present in this mixture?

- A) *A* and *D* B) *A* and *X* C) *Z* and *D* D) *Z* and *X*

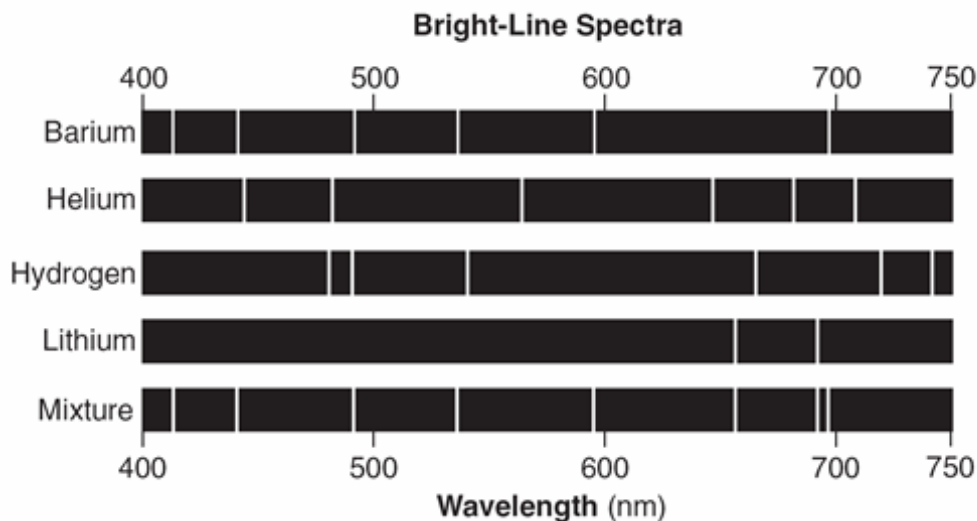
-
3. The diagram below represents the bright-line spectra of four elements and a bright-line spectrum produced by a mixture of three of these elements.



Which element is *not* present in the mixture?

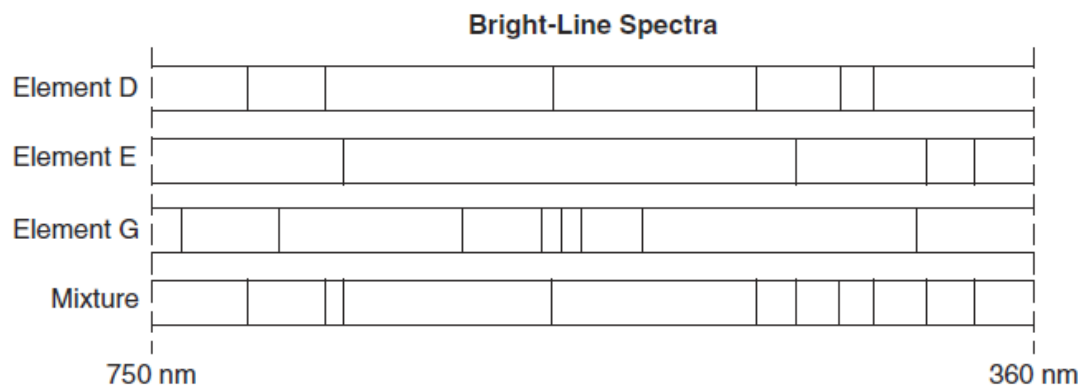
- A) *A* B) *D* C) *X* D) *Z*
-
4. During a flame test, a lithium salt produces a characteristic red flame. This red color is produced when electrons in excited lithium atoms
- A) are lost by the atoms
B) are gained by the atoms
C) return to lower energy states within the atoms
D) move to higher energy states within the atoms
5. The bright-line spectrum of an element in the gaseous phase is produced as
- A) protons move from lower energy states to higher energy states
B) protons move from higher energy states to lower energy states
C) electrons move from lower energy states to higher energy states
D) electrons move from higher energy states to lower energy states
-

6. The diagram below represents the bright-line spectra of four elements and a bright-line spectrum produced by a mixture of two of these elements.



Which two elements are in this mixture?

- A) barium and hydrogen B) barium and lithium
 C) helium and hydrogen D) helium and lithium
7. Given the bright-line spectra of three elements and the spectrum of a mixture formed from at least two of these elements:



Which elements are present in this mixture?

- A) *E* and *D*, only B) *E* and *G*, only C) *D* and *G*, only D) *D*, *E*, and *G*
-
8. When the electrons of an excited atom return to a lower energy state, the energy emitted can result in the production of
- A) alpha particles B) isotopes
 C) protons D) spectra
9. During a flame test, ions of a specific metal are heated in the flame of a gas burner. A characteristic color of light is emitted by these ions in the flame when the electrons
- A) gain energy as they return to lower energy levels
 B) gain energy as they move to higher energy levels
 C) emit energy as they return to lower energy levels
 D) emit energy as they move to higher energy levels

10. The characteristic bright-line spectrum of an element occurs when electrons

- A) move from lower to higher energy levels
- B) move from higher to lower energy levels
- C) are lost by a neutral atom
- D) are gained by a neutral atom