

Atoms and starlight.

1. If you could add a proton to an existing, stable atom, you would have created
 - a) a different element with a positive charge
 - b) an isotope of the original element
 - c) an ion of the original element
 - d) a molecule of the original element
2. A star emits light like a blackbody. If a star doubles its temperature, what happens to the wavelength at which it emits most of its energy?
 - a) it doubles
 - b) it halves
 - c) it stays the same
 - d) it quadruples
3. Atoms of different elements have a unique spectral signature of emission lines because each element
 - a) has a unique number of neutrons
 - b) has a unique set of photons
 - c) has a different temperature
 - d) has a unique set of electron orbits
4. A star is moving away from the Earth at 200 km/s. The H α Balmer line (which occurs at rest at 656.3 nm) would be observed at
 - a) less than 656.3 nm
 - b) more than 656.3 nm
 - c) 656.3 nm (i.e. its rest wavelength)
 - d) there is insufficient information to know