

29. They are not equivalent. Avogadro's law does not tell how the pressure, volume, and temperature are related, so you cannot use it, for example, to calculate the change in volume when the pressure increases at constant temperature. The ideal gas law, however, implies Avogadro's law. It yields  $N = nN_A = (pV/RT)N_A = pV/kT$ , where  $k = R/N_A$  was used. If the two gases have the same volume, the same pressure, and the same temperature, then  $pV/kT$  is the same for them. This implies that  $N$  is also the same.