

## DETAILS OF SEVERAL COMMON LASERS

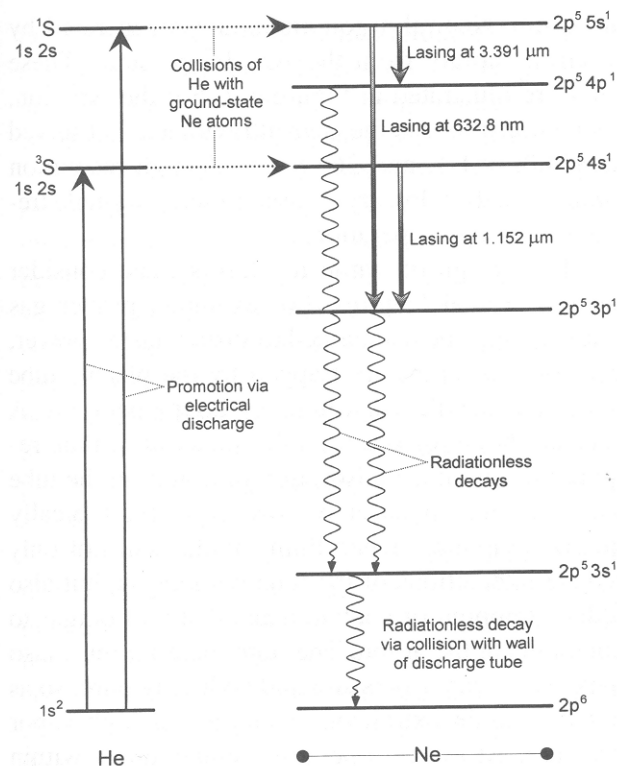


Figure 4-1

Energy level diagram for a helium-neon laser, a four-level laser system. Ground-state helium atoms are promoted to singlet and triplet excited states via electrical discharge. Collisional energy transfer of the excited-state He atoms to ground-state neon atoms populates excited states above the lowest excited state for neon, generating a population inversion. Lasing emission occurs at three wavelengths: 632.8 nm, 1.152  $\mu\text{m}$ , and 3.391  $\mu\text{m}$ . Two radiationless decay steps, the latter via collisional deactivation with the walls of the discharge tube, return neon to the ground state.

from *A Guide to Lasers in Chemistry*, G. R. Van Hecke and K. K. Karukstis, Jones and Bartlett: Boston, 1998.