How many litres of hydrogen gas will be produced by the decomposition of 90L of water? Assume that temperature and pressure are constant

2H2O 2H2 + O2

**Solution.** We have, that $V(H_2O)=90$ L, and $m(H_2O)=90$ g, tnen $n(H_2O)=m(H_2O)/M(H_2O)=90/18=5$ moles. According to the reaction equation: $n(H_2)=n(H_2O)=5$ moles, $n(O_2)=0.5n(H_2O)=2.5$ moles. The temperature and pressure are constant, then $V(H_2)=Vm\times n(H_2)=5\times 22.4=112$ litres.
**Answer:** 112 litres hydrogen gas.