

How much volume does 1 kg of CO₂ occupy at room temperature and standard pressure?

CO₂ has a molecular weight of 44 g/mol

1 kg CO₂ = 1000 g × (1 mol/44 g) = 22.7 mol CO₂

$V=nRT/P$, $V=(22.7)(0.0821)(300)/1 = 559$ L CO₂ at 27°C (300K), 1 atm

This is a little more than half a cubic meter approximately equal to the volume of two bathtubs or the trunk of a large car.

Good references:

- <http://www.thinkmetric.org.uk/volume.html>
- <http://www.chemistry.ohio-state.edu/betha/realGasLaw/>