

Re: oxygen concentration in a room

Source: <http://sci.tech--archive.net/Archive/sci.med/2007-07/msg00021.html>

- *From:* Jeff <kidsdoc2000@xxxxxxxxxxxx>
 - *Date:* Sat, 07 Jul 2007 18:21:58 GMT
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Jim wrote:

I need some help in trying to calculate the percentage of oxygen existing in a closed room. This is partly just for my interest, but there is a practical side to my question also.

I live in a recently built house that is one of these "super-insulated" structures with little outside air exchange except what is forced via fans. During the winter months I live primarily in a couple of rooms closed off from the main house to save on heating bills.

I have equipment that very accurately measures the carbon dioxide level in real time, that is located in my main living area. I live at 3000 feet elevation, and the house is all electric; no oxygen consuming heating, not even a wood burning stove. I don't have any way of directly measuring O₂ in the house.

The measured CO₂ in my living area ranges from approximately 500 ppm to over 2000 ppm. The higher concentrations generally occur during the winter months when I am spending more of my time indoors, and am preserving the heat by running the forced air intake fans less. (This will be changing in the future, as I will be forcing air from a solar heated porch into the house during some winter daylight hours)

My question is, from knowing the CO₂ concentration (and humidity percent also) in a closed space, how can I calculate the oxygen concentration? I know that the O₂ concentration of normal dry air is around 20.95 percent, but suspect that the relationship is not perfectly direct between the increase in CO₂ and the decrease of O₂.

Any help on this math problem would be appreciated.

Thanks
Jim

2000 ppm (parts per million) is 0.2%. The CO₂ comes from carbohydrates, amino acids and fats being oxidized (burned) by your cells. So the normal air concentration of oxygen in the air is 20.9%. If 0.2% of the O₂ gets reduced to CO₂, then the O₂ concentration would be 20.7%. (I am ignoring the CO₂ concentration in

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the atmosphere, which is around 0.04% or 400 ppm).

The numbers are an oversimplification, but, in real life, they aren't far off.

In other words, it doesn't change that much. And there is some O₂ leaking in and CO₂ leaking out through little gaps in the walls, under the doors, etc. No house is 100% airtight.

Jeff

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