

Interactive comment on “Simulation of trace gas redistribution by convective clouds - Liquid phase processes” by “Y. Yin et al.”

Y. Yin et al.

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R. Sander:

There seems to be a conversion factor missing in equation (4). Since the Henry's law coefficient is expressed in $[\text{mol dm}^{-3} \text{ atm}^{-1}]$ and the mixing ratio is dimensionless, the term $M_{d,i,r}/H_i^*$ has the unit $[\text{dm}^3 \text{ mol}^{-1} \text{ atm}]$. This term is subtracted from the product $V_r N_r P_i$ which represents a pressure. Thus the units do not match.

The authors:

In equation (4), $M_{d,i,r}$ is expressed in mole of gas per mole of air (or molar mixing ratio respect to air), and N_r is the number of drops per mole of air. Thus the units in the two terms match each other. The text has been clarified according to this.

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R. Sander:

The maxima of the integrated species mass in Fig. 14 appear on isolated patches with the height approximately being equal to the source altitude. Why are these patches not connected? Is this a real phenomenon or is it a model artefact that arises from the S72 discretization of the vertical axis?

The authors:

The reason that the maxima of the integrated species mass in Fig. 14 appear as isolated patches is that the source altitudes chosen for this calculation were twice the vertical grid spacing.

R. Sander:

Schwartz (1984) is cited as the reference for the Henry's law coefficient of NO₂. However, I was unable to find this value in that paper. Is the reference correct?

The authors:

The reference is Schwartz and White (1981), not Schwartz (1984). This has been corrected in the text.

Interactive comment on Atmos. Chem. Phys. Discuss., 1, 125, 2001.

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