

***Interactive comment on* “The role of transition metal ions on HO_x radicals in clouds: a numerical evaluation of its impact on multiphase chemistry” by L. Deguillaume et al.**

Anonymous Referee #1

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General Comments This paper presents a model exercise on bi-phase chemistry occurring in an atmospheric cloud. The overall quality is good and sound scientific. Especially in the "short" discussion section, the authors focus rather on an urban scenario rather than on rural or marine, but they don't explain why. I suggest that the authors enlarge this section appending discussion on rural and marine situation concerning sensitivity tests. One of the important feature at my opinion is the evolution of the TMI sensitivity with the pH, because the simulated values of pH are looking very low. Section 3 line 7, the authors do not precise if pH conditions are calculated or forced. If calculated, the low values of pH may be coming from an underestimation of alkaline contents in the atmosphere, e.g. carbonates and amoniac. As cloud water pH is a balance of alkaline and acidic species, pH may quickly shift from 3.5 to 6 by very little

variations of acid and bases. Finally, the authors may add in their conclusions some guidelines to indicate what should be measured on the field in clouds, and what kind of laboratory experiments are necessary to advance.

Specific comments 1 Introduction, line 22: metals are as oxide, but also silicates and oxo-hydroxides.

3.1, line 10-17: I can't understand this paragraph, the description of set up concentrations is obscure.

3.1, line 18-22 + Figure 1: On the figure, you use a logarithmic scale for concentrations and a linear for ratio. You should also put a logarithmic scale for ratio to be consistent. But, I would guess to be more informative if you use a linear scale for concentrations and put FeII% rather than ratio.

Technical corrections Table 1: Print K and not °K for the unity kelvin. Also in table 2, 3, 4 but done in table 5!

Table 5: don't use this double arrow to print equilibrium. This symbol must be used for mesomeric description. I suggest you use the equal sign ("=") or as previous tables, separate in two columns "Reactants" and "products".

All tables: I do not agree writing a complex ion with [] brackets. Removing these brackets do not confuse the formula, and preserve the reserved usage to indicate concentrations.

Figure 5 is too small and difficult to read (also figure 4)

Interactive comment on Atmos. Chem. Phys. Discuss., 3, 5019, 2003.

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