

In this paper, in-situ Raman technique was used to research the photochemistry in nitrate-glycine mixed particles at various RHs. The apparent nitrate photolysis rate constants and percentages GC decay were obtained. The phase transition behaviors of nitrate-glycine were obtained, which showed the role of molecular interaction in determining the physicochemical properties and chemical reactivity of particles. In AN+GC mixed particles, the glycine photochemistry is negligible, and nitrate photochemistry is weak. But in SN+GC mixed particles, products of nitrate and glycine photochemistry, $\text{HNO}_2/\text{NO}_2^-$, amide, ammonia or/and amine are detected, and the apparent nitrate photolysis rate constant is 4.5-folds higher than that of AN+GC particles.

Questions and comments:

1. In line 57, the word “behaviors” should be deleted.
2. In line 134, the number “1/2” in equation (6) should be removed.
3. In line 136, “Equation 9” does not exist, it should be changed to “Equation 7”.
4. In line 139, “/” in equation (7) is misleading, it is better to change it to “or”.
5. In this paper, the mole ratio of 1:1 for glycine and nitrate is used in all the experiments, but the photochemistry of pure glycine solution and pure nitrate solution are not studied. If the photochemistry of pure species is missing, how can we conclude that there exists an interaction between glycine and nitrate in the mixed particles affecting their photolysis?
6. In line 232, the viewpoint “The apparent nitrate photolysis rate constant J shows good correlation with the percentage GC decay ($R^2=0.99$, Figure4b), which may suggest that nitrate photolysis is the key driver for the glycine decay” is proposed. But photolysis rate constant J is determined by illumination intensity, and according to Eq.2, J is independent on solute concentration. In Figure 4b, various apparent nitrate photolysis rate constants are displayed and the illuminant of 300nm LED lamp is used in the experiments, so what is the definition of apparent nitrate photolysis rate constant in this paper? Is the x-axis label wrong in Figure 4b? And should it be change to nitrate photolysis rate instead?