This manuscript presents a comprehensive theoretical investigation into the nucleation activity of amine ozonation products, combining quantum chemical calculations with cluster dynamics simulations. The findings are novel and of significant interest to the atmospheric chemistry community, particularly regarding the sustained role of amine derivatives in sulfate-driven new particle formation (NPF) under humid and dark conditions. I recommend some revisions before publication:

1. The abstract and conclusion state that "humidity strongly activates all systems", which is correct. However, the temperature effects (3–14 orders of magnitude drop for OH-amines, 1 order for CHO-amines) are equally striking and deserve more prominent emphasis in the graphical abstract.

2. The paper demonstrates that the pseudo-first-order hydrolysis rate constants k_p of these amine derivatives are orders-of-magnitude higher than the $^{\bullet}$OH-initiated SO_2 oxidation rate constant from literature. It should be noted that k_p and real-atmosphere effective rate, considering realistic low ambient concentrations of these OH-/CHO-amines. Readers need to better understand under what real-world concentration ranges this non-radical pathway can outcompete traditional ·OH oxidation.

3. The conclusion that CHO-amines require RH > 80% to be effective (Section 3.4) is valuable, yet the manuscript does not quantify how often such high humidity co-occurs with elevated ozone and amine emissions in typical haze episodes. A brief discussion using representative field data would contextualize the practical relevance of this pathway.

4. In the ACDC simulations, the concentrations of OH-/CHO- amines is fixed at 1 ppt. However, the actual atmospheric concentrations of these amine ozonation products may be significantly lower than their parent amines, and would dynamically change with the ozonation process. Although the paper notes that the J values for certain products are comparable to their parent methylamine, this is based on the assumption that the product concentration is identical to the parent amine. If product concentrations were significantly lower (e.g., 10-100 times lower), would the J values still remain comparable? I suggest the authors include additional scenario simulations at different amine concentrations (e.g., 0.1 ppt, 0.01 ppt) to assess the impact of concentration changes on the conclusion of "functional equivalence" and to more realistically reflect the NPF potential under atmospheric conditions.

5. The protonated form, such as $NH_3OH^+ \cdot HSO_3^-$ in Figure 1b should be properly noted and described in the manuscript text.

6. In the graphical abstract, the term "bisulfate" should be corrected to "bisulfite", which means HSO_3^-. Such errors should be carefully checked and corrected throughout the manuscript.