Wang et al. present a novel formation mechanism of sulfamic acid (NH_2SO_3H) and its enhancement effect in methanesulfonic acid-methylamine (MSA-MA) aerosol particle formation. The study centers on the production, consumption, and potential pollution impacts of sulfamic acid over agriculture-intensive and coastal industrial regions. The most part of this manuscript is well written and of broad interest to the readership of *Atmospheric Chemistry and Physics*. I recommend publication in *Atmospheric Chemistry and Physics* after the following comments have been addressed.

Specific Comments:

Comment 1: Pages 2- 3 lines 57-62: "As the direct hydrolysis of $HNSO_2$ with a high energy barrier takes place hardly in the gas phase, the addition of a second water molecule, formic acid and sulfuric acid (H_2SO_4, SA) have been proved to promote the product of NH_2SO_3H through the hydrolysis of $HNSO_2$. However, to the best of our knowledge, the gaseous hydrolysis of $HNSO_2$ with CH_3SO_3H has not yet been investigated"

The necessity for studying the gaseous hydrolysis of $HNSO_2$ with CH_3SO_3H is not sufficiently clarified. Is there any research or evidence indicating that the reaction processes you introduced earlier are insufficient to explain the source of sulfamic acid? If so, please provide additional information.

Comment 2 Page 6 lines 155-156: "The ACDC model was utilized to simulate the $(MSA)_x(MA)_y(SFA)_z$ ($0 \le y \le x + z \le 3$) cluster formation rates and explore the potential mechanisms"

The structural stability of clusters directly impacts the nucleation ability of a multi-components system. How was the most stable structure of $(MSA)_x(MA)_y(SFA)_z$ ($0 \le y \le x + z \le 3$) clusters used in this paper obtained?

Comment 3 Page 6 lines 158-160: "Thermodynamic parameters, obtained from quantum chemical calculations executed at the M06-2X/6-311++G(2df,2pd) level, were used as inputs for the ACDC model"

Please further justify for why the M06-2X/6-311++G(2df,2pd) level of theory was employed to obtain the thermodynamic parameters used as inputs for the ACDC model.

Comment 4 Page 13 lines 362-366: "Secondly, the contribution of the pathway with SFA exhibits a negative correlation with [SA] (Fig. 8 (c)), attributed to the competitive relationship between SFA and MSA. Thirdly, the contribution of the SFA-involved cluster formation pathway was positively associated with the concentration of [SFA] (Fig. 8 (d))"

Rather than fixing the concentrations of other precursors and discussing the impact of changes in a single component's concentration, I think it would be more valuable to explore the specific nucleation mechanisms in regions such as India or China by incorporating observational concentrations of SFA, MSA, and MA as reported in field studies.

Comment 5: The boundary of the ACDC simulation is the smallest clusters that can be stable enough to

grow outside of the simulated system. What's the boundary of the present ACDC simulation?

Minor Comments:

Comment 1 Page 3 line 89: "Due to the concentration of SA …. , MSA-driven NPF has attracted growing attention"

Please use either "MSA" or "CH_3SO_3H" consistently to represent methanesulfonic acid. The same issue also appears on representation of sulfamic acid.

Comment 2 Page 4 line 107-108: "Atmospheric Clusters Dynamic Code (ACDC) models to evaluate the potential effect of SFA on nucleation and NPF."

Please cite the original publications of ACDC models. Additionally, cite some research to demonstrate the reliability of this method.

Comment 3 Page 17 line 473-478:

Some references include article links, while others do not. Please unify the reference format.

Comment 4 Page 28 line 691-692:

The y-axis in Figure 6 contains too much information. It is recommended to adjust the layout to make the results more visually concise.