

The author used the tandem system of DMA-CCN coupled with SP2 to directly monitor the droplet activation diameter (D_{50}) and activation fraction of BCc in ambient environment. Further, the author also quantifies activation properties of BC on a time scale, and found BCc from anthropogenic sources can readily serve as CCN at a relatively low SS. I believe that the topic is interesting and it could be useful to the scientific community. However, some modifications are needed before it can be accepted.

Major comments:

1. The author calculates the photochemical age by the toluene/benzene ratio. However, even during the day, toluene can be affected by air mass transport, local emissions, or solvent volatilization, which introduces considerable uncertainty to the calculation. Can the author give more information support your result?
2. Lines 233-238, As far as I know, the chemical composition on BC was different with that of all particles, which may lead to the deviation of the κ of BC calculated based on this method, can the author further elaborate on this?

Specific comment:

Line 196: xxx is the ration of measured, may be ratio? Rather than ration.