The manuscript by Li et al. investigated the sensitivity of a Q-ACSM for the measurements of chamber secondary organic aerosol (SOA) from three volatile organic compounds. The authors found that the sensitivity of the Q-ACSM to SOA was found to be anti-correlated with the aerosol oxidation state regardless of the VOC precursors. This study also shows the applicability of Q-ACSM in chamber studies although rare studies use Q-ACSM for chamber studies because of low sensitivity and time resolution. This manuscript is generally well written and fits within the scope of AMT. However, some conclusions are overstated and need more evidence.

Major comments:

1. The authors concluded CE as a function of particle phase states, which needs to be reconsidered. First, the RH was maintained at 10 – 15% during the experiments, we could not expect the changes in phase states of SOA particles. Second, Docherty et al. (2013) also showed the variations of CE as a function of f44/f57, which is primarily caused by particle bounce at the vaporizer.
2. It is difficult for this manuscript to conclude that RIE changes as SOA evolves from HOA to more oxygenated OOA. This is an SOA experiment, which cannot give you any information on HOA. Many factors can affect the anti-correlation between RF and f44, but RIE would not be the important one. As shown in the latest research by Xu et al. (2018), organic aerosol with OS below -1.5 can have much high RIE, but in this study, the f44 does not support this.
3. I would also suggest the authors comparing the result in this study with those previously reported by HR-ToF-AMS. For example, f44 vs. f43 could be different. Q-ACSM might reports much higher f44 than that of HR-ToF-AMS (Fröhlich et al., 2015).

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