Response to Reviewer #2

General comments:

It has been well recognized that cooking emissions substantially contribute to atmospheric organic aerosols (OA), but studies on their characterization are scarce. Hence, investigation on primary and secondary OA contributions from such emissions is highly needed. This study focused on the characterization of POA and SOA produced from heated cooking oils in laboratory experiments, based on the obtained mass spectra via PMF analysis. The residual spectrum method has also been applied to separate the POA and SOA using different tracer ion signals. The authors have successfully separated the POA and SOA produced from heated palm and olive oil by PMF analysis. Further they found that residual spectrum method is not valid to calculate POA for photochemical aging of cooking oils. The results obtained from this study are interesting and the paper is written very well. Therefore, this paper is worthy to publish in ACP, after addressing the following specific comments:

Specific comments:

Q1: It has been noted (in Section 2.1; lines 142-144) that particle number concentrations and size distributions were measured using SMPS, but did not presented the obtained data in the paper. It is important to show the particle number concentrations and size distributions during the total period of the experiments, particularly during the period before the start of photochemical aging to understand the impact of gases absorption on to seed particles on the POA loading.

R1: See response to Q1 of Reviewer #1.

Q2: Surprisingly, the concentrations of POA emitted from heated palm oil and olive oil were gradually reduced starting from ~1 h and 2 h, respectively, before the start of photochemical aging and reached to almost negligible level in 4~2 h period of the aging, which has been attributed to the wall loss. However, it is not so clear whether the reduction of POA occurred due to wall loss (and/or) due to the (heterogeneous) transformations of the POA to SOA? In fact, the enhanced reduction of the olive oil POA after start of photochemical aging has been interpreted for heterogeneous

oxidation of the POA, but how about the very rapid reduction of POA before the start of the aging (Figure 1)?

R2: In the original manuscript (Line 193-194), we have mentioned that the rapid reduction of POA before the start of the aging was due to the wall loss. Heterogeneous reactions were not expected during this period because of the absence of oxidants (O_3 and/or OH radicals). After the start of photochemical aging, we have clearly shown that the reduction of POA in palm oil experiment was solely due to the wall loss while both the wall loss and heterogeneous oxidation played a role in POA reduction for olive oil experiment (Line 214-231).