We thank the reviewers for their time and comments. Below are detailed responses to each comment.

Response to anonymous referee #2 comments:

1) **It is a bit tedious to read and I would recommend to streamline it. Overall I would recommend to accept it as is, but would urge the authors to tone done inferences about the health effects and to make conclusions about the oxidative potential only. Other studies should complement this study in order to understand the health effects, which may not depend solely on the oxidative potential. An example is the sentence in the abstract, lines 22-24.**

   We believe that the manuscript flows well as structured. We have deleted extrapolations regarding potential cellular effects, but believe that inferences about health effects are justifiable as previous studies have shown associations between DTT activity and various health endpoints, including emergency room visits for asthma/wheeze and congestive heart failure, and incidence of rhinitis (Fang et al., 2016; Bates et al., 2015; Yang et al., 2016).

   We have made the following modifications.

   Line 23: "Together, these results suggest that precursor identity may be more influential than reaction condition in determining SOA oxidative potential,…"

   Line 327: deleted "Nitroaromatics are also known to have mutagenic properties and polyaromatics may further induce toxicity via DNA adduct formation (Baird et al., 2005; Helmig et al., 1992). As such, polyaromatic precursors may have significant health implications beyond redox imbalance."

References:

Baird, W. M., Hooven, L. A., and Mahadevan, B.: Carcinogenic polycyclic aromatic hydrocarbon-DNA adducts and mechanism of action, Environmental and Molecular Mutagenesis, 45, 106-114, 10.1002/em.20095, 2005.

Bates, J. T., Weber, R. J., Abrams, J., Verma, V., Fang, T., Klein, M., Strickland, M. J., Sarnat, S. E., Chang, H. H., Mulholland, J. A., Tolbert, P. E., and Russell, A. G.: Reactive Oxygen Species Generation Linked to Sources of Atmospheric Particulate Matter and Cardiorespiratory Effects, Environmental Science & Technology, 49, 13605-13612, 10.1021/acs.est.5b02967, 2015.

Fang, T., Verma, V., Bates, J. T., Abrams, J., Klein, M., Strickland, M. J., Sarnat, S. E., Chang, H. H., Mulholland, J. A., Tolbert, P. E., Russell, A. G., and Weber, R. J.: Oxidative potential of ambient water-soluble PM2.5 in the southeastern United States: contrasts in sources and health associations between ascorbic acid (AA) and dithiothreitol (DTT) assays, Atmos. Chem. Phys., 16, 3865-3879, 10.5194/acp-16-3865-2016, 2016.

Helmig, D., Arey, J., Harger, W. P., Atkinson, R., and Lopez-Cancio, J.: Formation of mutagenic nitrodibenzopyranones and their occurrence in ambient air, Environmental Science & Technology, 26, 622-624, 10.1021/es00027a028, 1992.

Yang, A., Janssen, N. A. H., Brunekreef, B., Cassee, F. R., Hoek, G., and Gehring, U.: Children's respiratory health and oxidative potential of PM2.5: the PIAMA birth cohort study, Occupational and Environmental Medicine, 10.1136/oemed-2015-103175, 2016.