

# ***Interactive comment on “Dynamic changes of optical and chemical properties of tar ball aerosols by atmospheric photochemical aging” by Chunlin Li et al.***

## **Anonymous Referee #1**

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General This is an interesting paper where 'tar ball aerosol particles' were produced and photochemically aged in an OFR. I am not sure whether tar balls in atmospheric aerosol particles are an important topic. As they are mentioned in the title, the reader expects tar balls to be central for this paper, but it seems to me, the real topic of the paper is BrC formed after wood combustion and tar balls have been identified with that BrC. Maybe the authors can straighten this out with regard to the title and the focus of the introductory text part.

## **Details**

The specific tar ball aerosol generation is interesting. However, this is a laboratory

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method to obtain as much as possible tar balls in the generated aerosols. How realistic is this aerosol for the environment ? I wonder if some key parameters of the 'tar ball aerosol' generated in the lab should be given in the experimental, or, at the latest, early in the results section: Give the particle size distribution, give a rough chemical composition, OC/EC/ WSOC, weight fraction of tar balls. Do these particles still contain inorganic constituents ? How much ?

When this is not done, the reader starts into the results section without knowledge about what has actually been generated and is now undergoing heterogeneous oxidation in the OFR.

Much of this information is available, but scattered through the manuscript. I would strongly recommend to introduce a section 'Initial tarball aerosol characteristics after generation'

Maybe the chemical information and the optical measurement results should be separated.

Overall, the manuscript calls for a better organisation.

The obtained results are interesting but their atmospheric relevance should be discussed in view of realistic fraction of tar balls over EC or over OC.

Some statements in the conclusion section are very broad, line 676 ff. Please reconsider.

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