

## Characterization of Urban Grime Photochemistry as Sink or Source for Air Pollutants (GrimePaSS)

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The improvement of urban air quality in Europe is a major concern that strengthens the interest in understanding the most relevant chemical processes and pathways of air pollutants, like nitrogen oxides ( $\text{NO}_x$ ), ozone ( $\text{O}_3$ ) and several volatile organic compounds (VOCs). Besides gas phase chemistry, also heterogeneous and multiphase reactions, when gases interact with urban surfaces (e.g., windows, building walls, rooftops, sidewalks, roads, etc.), are processes which could affect the fate of air pollutants. When such surfaces are exposed to the atmosphere for a certain time, it is known that a so called “urban grime” film consisting of inorganic and organic components will develop. However, the knowledge about the interaction of this new environmental compartment with air pollutants under illumination is still limited.

Therefore, the present study combines real urban grime sampling with intensive laboratory experiments to characterize the photoreactive behavior of urban grime at impervious surfaces. Small lab scale photoreactor experiments with clean air or with selected air pollutants (e.g., nitrogen oxides) are performed under variation of experimental conditions, like relative humidity, to investigate whether urban grime is potentially acting as a sink or even as a source for air pollutants. The experimental approach is extended by the analysis of the urban grime chemical composition using CPP-GC-MS for the organic and ion chromatography for the inorganic content before and after these photoreactivity experiments. The presentation will provide preliminary results on the impact of urban grime photochemistry, collected in the urban background of Leipzig, Germany, on air quality.