**CMD Data Reporting Sheet HEP**

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Project title: Heterogeneous formation of HONO on tropospheric aerosol particles  
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### Reaction

<table>
<thead>
<tr>
<th>Reaction</th>
<th>Initial reaction probability</th>
<th>Final react. Prob.</th>
<th>yield</th>
<th>Ref., remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO$_2$ + 1,2,10-anthracenetiol = products</td>
<td>$1 \times 10^{-6}$ at $X_{NO2} = 20$ ppb</td>
<td>$5 \times 10^{-7}$ at $t = 5$ h</td>
<td>100% HONO</td>
<td>1a</td>
</tr>
</tbody>
</table>

### Mechanistic information, if available

**Proposed mechanism**

1. Reversible adsorption of NO$_2$ (Langmuir isotherm) and water (BET isotherm) on the surface

$$ \theta_{NO2} = \frac{K_{NO2} \times X_{NO2}}{1 + K_{NO2} \times X_{NO2}} $$

with $K \approx 2 \times 10^{-3}$ ppb$^{-1}$

$$ \theta_{H2O} = \frac{V_{H2O,ads}}{V_{H2O,monos}} \left( \frac{c \times rh}{1 - rh} \right) $$

with $c \approx 10^2$

2. Hydrolysis and dissociation of OH group

3. Electron transfer from phenoxide ion to NO$_2$, protonation and release of HONO

**Overall reaction rate:**

$$ R_{HONO} = k_s \times N_s \times \theta_{NO2} \times [Ar(OH)] $$

with $N_s \approx 10^{13}$ cm$^{-2}$ and the surface reaction rate constant, $k_{HONO} \approx 10^{17}$ cm$^2$s$^{-1}$

### Ref., remarks *)

<table>
<thead>
<tr>
<th>Ref., remarks</th>
<th>Details</th>
</tr>
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</table>

*) Use **index a** for peer-reviewed publications; **index b** for “grey literature”, **index c** for remarks etc.