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Benzene in Titan's atmosphere from Cassini CIRS data

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Benzene was detected in Titan's stratosphere from ISO and Cassini/CIRS observations near 674 cm-1 [1, 2, 3]. It was also detected in Titan's upper atmosphere by modelling INMS data [4]. Benzene is a precursor of polycyclic aromatic hydrocarbons (PAHs), which are important species detected in the interstellar medium and in our Solar System. The distribution of benzene in the satellite's neutral atmosphere has been determined from CIRS nadir and limb data [5, 6]. It shows a strong enhancement to the north, while it is absent at low southern latitudes. The pathways to the formation of benzene have been explored in different photochemical models [7,8,9]. We explore here the connection between C6H6 measurements in the upper and middle Titan atmosphere by modelling its spatial distribution and we look at the possible mechanisms for its formation in the atmosphere of Titan. Benzene profiles determined in this study suggest an important path for the formation of higher-order hydrocarbons, which may play a significant role in the formation of hazes in Titan's atmosphere.

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