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## Surface formation routes of interstellar molecules : a laboratory study

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## **Surface Formation Routes of Interstellar Molecules**

### **A Laboratory Study**

1. Hydrogenation of CO ice provides an efficient pathway to form both interstellar solid H<sub>2</sub>CO and CH<sub>3</sub>OH at low temperatures.  
*Chapters 2 and 7*
2. The water formation reaction network described by Tielens & Hagen (1982) is more complex than proposed.  
*Chapters 3 - 6*
3. The surface formation of CO<sub>2</sub> is chemically linked to the formation of H<sub>2</sub>O in the ice.  
*Chapter 7*
4. CO<sub>2</sub> can be formed in the solid phase with and without energetic input.  
*Chapters 7 and 9*
5. Surface reactions in simple ices may reveal a complex solid state chemistry.
6. A bottom-up and a top-down approach have one thing in common: the middle.
7. The past decades have proven the importance of a good interaction between astronomical observations, laboratory experiments and astrochemical modeling.
8. The research of knowledge brings wealth.
9. Finishing a PhD is like climbing a long mountain route: the sky is the limit and falling down is not an option.
10. H-atom bombardment as an email subject header may attract the attention of non-scientists.
11. Extreme climatic conditions are the worst enemies of cyclists.
12. My best proposition is the one I have not written yet.