

ABSORPTIONS IN THE VISIBLE OF  
PROTONATED PYRENE  
COLLISIONALLY COOLED TO 15 K

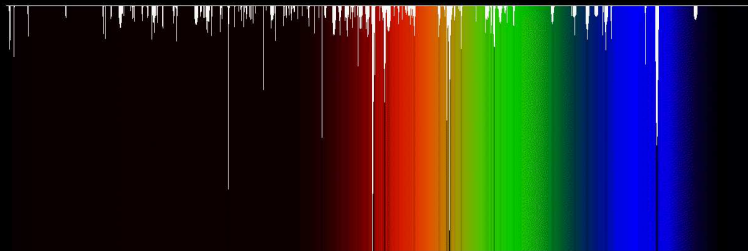
C. A. Rice, F.-X. Hardy, O. Gause, and J. P. Maier

*Department of Chemistry, University of Basel,  
Klingelbergstrasse 80, 4056 Basel*

International Symposium on Molecular Spectroscopy  
69th Meeting – June 16-20, 2014  
Champaign-Urbana, Illinois

18.06.2014

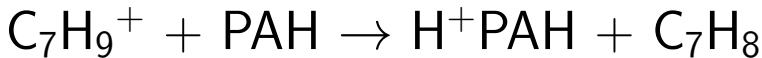
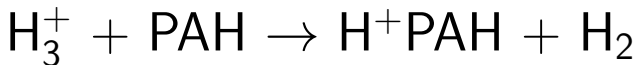
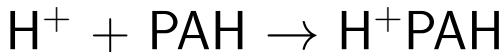
## The Diffuse Interstellar Bands



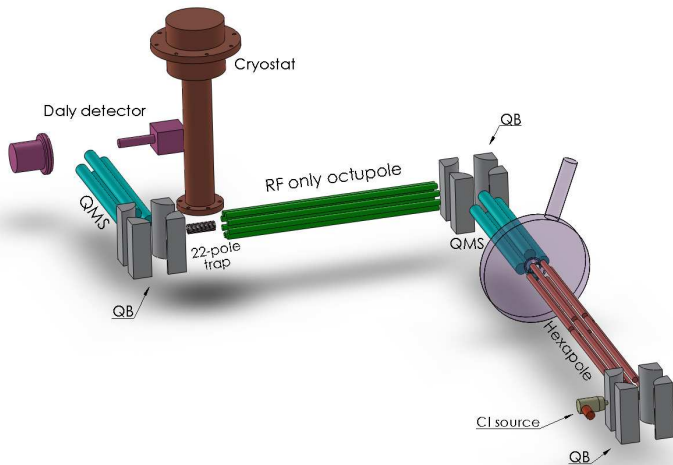
Courtesy: P. Jenniskens, F.-X. Desert

# Protonated polycyclic aromatic hydrocarbons

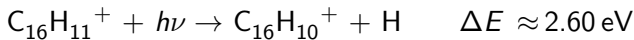
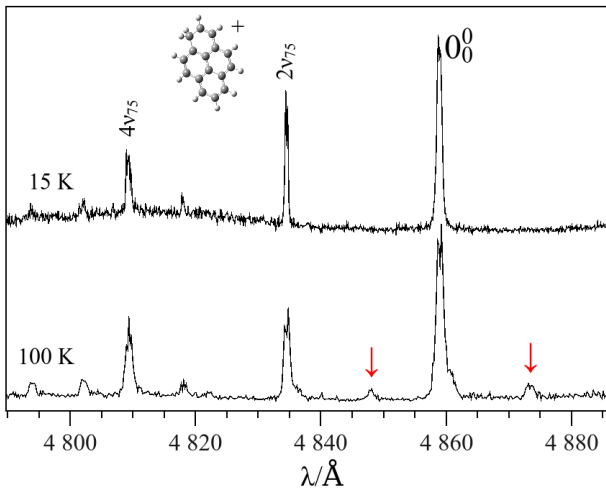
molecule	PA/kJ mol <sup>-1</sup>
toluene	784
pyrene	869
coronene	861

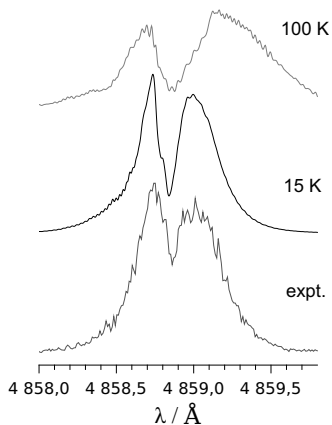


# Experimental setup



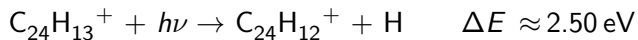
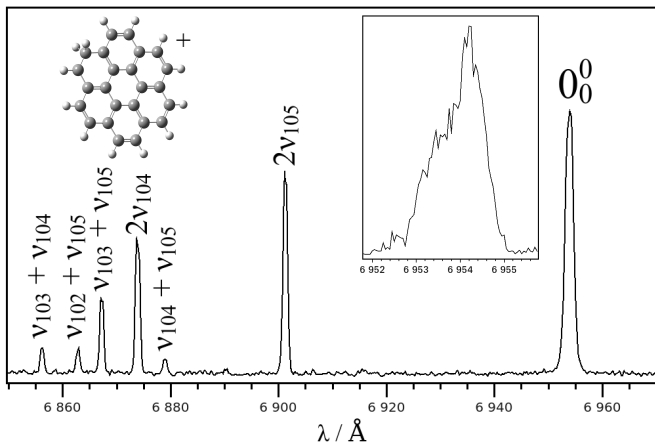
# (1) ${}^1A' \leftarrow X{}^1A'$ electronic transition of $C_{16}H_{11}^+$



$0_0^0$  band –  $(1)^1A' \leftarrow X^1A'$  electronic transition of  $C_{16}H_{11}^+$ 

const.	$X^1A'$	$(1)^1A'$
$A/\text{cm}^{-1}$	0.0338	0.0348
$B/\text{cm}^{-1}$	0.0182	0.0168
$C/\text{cm}^{-1}$	0.0119	0.0118
$\tilde{\nu}_{00}/\text{cm}^{-1}$		20 575.35

# (1) ${}^1A'$ ← $X{}^1A'$ electronic transition of $C_{24}H_{13}^+$



# Conclusions and Outlook

- (1)  ${}^1A' \leftarrow X {}^1A'$  electronic transition measured
- $C_{16}H_{11}^+$  and  $C_{24}H_{13}^+$  are not carriers of known DIBs
- $H^+$ PAHs have a permanent dipole moment

to be continued...

- $H^+$ PAHs  $C_nH_m$   $n > 40$
- non-planar structures
- incorporation of an ESI source



# Acknowledgements

- Financial Support
  - Swiss National Science Foundation
  - European Research Council
  - University of Basel
- Electronic and Mechanical Workshops
- Everyone in the Maier Group

# Acknowledgements

