A
Vapor pressure curves

The vapor pressure data of polyaromatic hydrocarbons and the extrapolation of the data using Antoine's fit function are presented in this Appendix. The temperature dependence of the vapor pressure is given by the Clausius-Clapeyron equation:

$$p(T) = p_0 \exp\left(-\frac{\Delta H_s}{k_B T}\right),$$

where p_0 is the vapor pressure as $T \to \infty$, and ΔH_s is the enthalpy of sublimation at temperature T. Due to the commonly observed increase in the enthalpy of sublimation with temperature, the vapor pressure extrapolation is carried out here by Antoine's fit function:

$$\ln[p(T)] = A - \frac{B}{T + C},$$

where A, B and C are fit coefficients. Table A.1 displays the fit parameters A, B and C. In Fig. A.1, the literature vapor pressure data of PAH molecules and the

Table A.1.: Compilation of Antoine's fit coefficients

Molecule	A	B (K)	C (K)
Benzene	26	7640	30
Naphthalene	43	20100	124
Coronene	37	30400	184

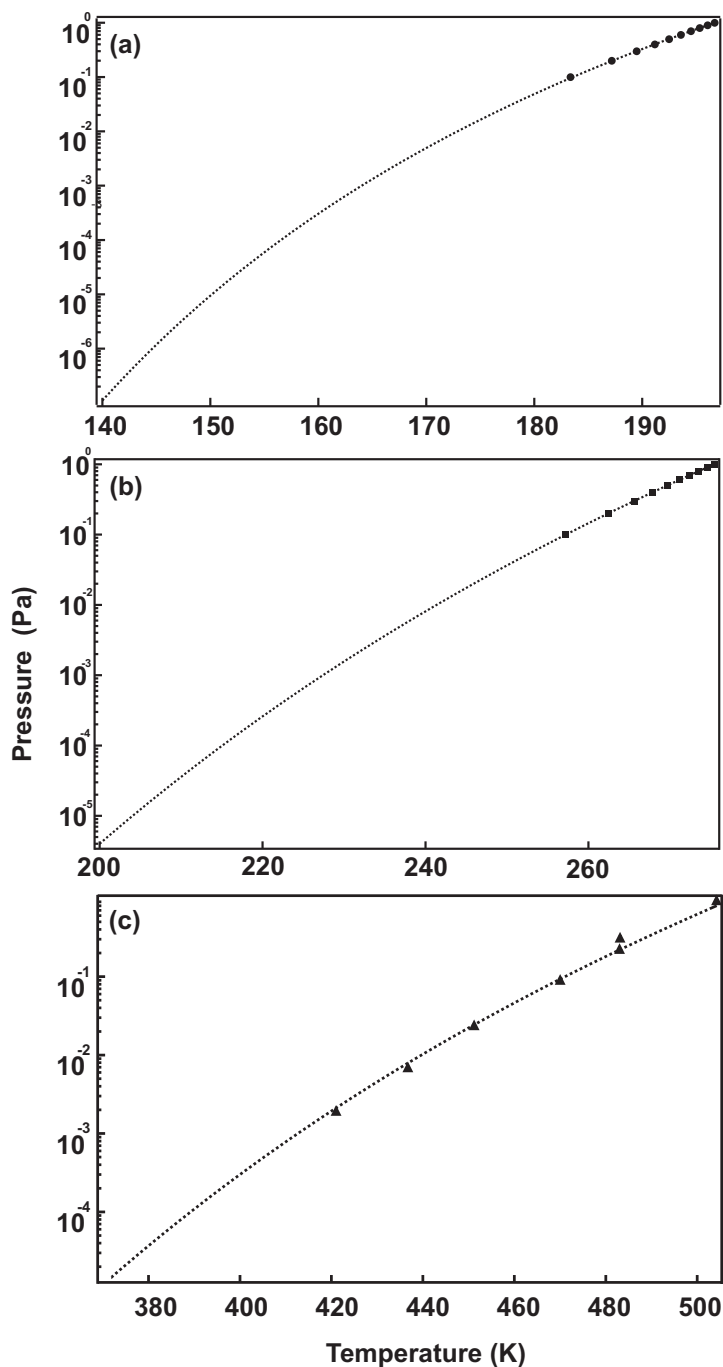corresponding Antoine's fits are displayed.

Figure A.1.: (a) Vapor pressure of the benzene (●) in the temperature range 180–200 K and Antoine's extrapolation (broken line) to desorption temperature [152 K] (b) Vapor pressure of naphthalene (■) in the temperature range 255–275 K and Antoine's extrapolation (broken line) to desorption temperature (235 K). The data is adapted from de Kruif [1980]. (c) Vapor pressure of coronene (▲) in the range 420–505 K and Antoine's extrapolation (broken line) to desorption temperature (390 K). The data is adapted from Oja and Suuberg [1998].

B
Instruments

B.1. UHV system

- UHV chamber and Manipulator, Vakuum Anlagen-Bau GmbH

- Turbo-molecular pump, Leybold, Turbovac 361 C, pumping speed N_2: $340\,l\,s^{-1}$

- Turbo-molecular drag pump, Leybold, HyCone 60, pumping speed N_2: $60\,l\,s^{-1}$

- Rotary vane pump, Leybold, Trivac B, pumping speed N_2: $4.3\,m^3\,h^{-1}$

- Membrane pump, Leybold, Divac 2,5 VT, pumping speed N_2: $2.2\,m^3\,h^{-1}$

- Pirani gauge: Pfeiffer Vaccum, CMR 263

- Bayard-Alpert ionization gauges, Arun microelectronics

- Quadrepole mass spectrometer, LedaMass Spectra Satellite 220 D

- Verdampfer Cryostat, Janis Research, ST 400.

- LakeShore 340 Temperature controller

- Powersupply system, SM 35-45, SM540-D, Delta Electronika

B.2. Sample preparation

- HOPG crystal: Pyrolytic graphite monochromator, Advanced Ceramics, ZYB $12\,\text{mm} \times 12\,\text{mm} \times 1\,\text{mm}$

- Carbon nanotube solution: Single-wall carbon nanotubes, stock PO 53100-10, Tubes@Rice and HipCO SWNTs, CNI, Houston, USA.

- Carbon nanofibers: Applied Science Inc., Cedarville, USA.

- Polyaromatic hydrocarbons: benzene (99.99 %), naphthalene (99.99 %), Aldrich GmbH; coronene (98 %)and ovalene (99 %), Dr. Ehrenstorfer GmbH)

- Ethylbenzene: (99.99 %), Aldrich GmbH

- Labor gas: Xe, SF_6 Messer GmbH

- Hydrogen peroxide (60 % aqueous solution), Solvay Interox GmbH

- Colloidal graphite: Agar Scientific, Essex, England

- Polycarbonate membrane filter: pore size 0.5 µm, Millipore®

B.3. Data acquisition

- PCI-MIO 16-E multipurpose data acquisition hardware, National Instruments

- GPIB interface, National Instruments

- LabVIEW® 6.1, National Instruments