



Supporting Information

for

An advanced structural characterization of templated meso-macroporous carbon monoliths by small- and wide-angle scattering techniques

Felix M. Badaczewski, Marc O. Loeh, Torben Pfaff, Dirk Wallacher, Daniel Clemens and Bernd M. Smarsly

Beilstein J. Nanotechnol. **2020**, *11*, 310–322. [doi:10.3762/bjnano.11.23](https://doi.org/10.3762/bjnano.11.23)

Formulae used for the calculation of parameter based on the SANS data

Formulae used for the calculation of parameter describing the carbon pore structure based on the SANS data [1,2]:

$$k = 4\pi \int_0^{\infty} s^2 I(s) ds = V\varrho_{carbon}^2(1 - P)P \quad (S1)$$

k : normalized Porod invariant

s : scattering vector

$I(s)$: scattering intensity

V : irradiated volume

ϱ_{carbon} : neutron scattering length density of carbon

P : porosity

$$g(r) = -8 \int_0^{\infty} \left(1 - \frac{2\pi^3 s^4 l_p I(s)}{k}\right) \frac{d^2}{d(2\pi r s)^2} \left(\frac{\sin(2\pi r s)}{2\pi r s}\right) ds = \sum_{j=0}^N a_j g_j\left(\frac{r}{b}\right) \quad (S2)$$

$$g(r) = \sum_{j=0}^N a_j g_j\left(\frac{r}{b}\right) \quad (S3)$$

$$g_j(r) = \frac{1}{j!} \left(\frac{r}{b}\right)^j e^{\left(-\frac{r}{b}\right)^m} \quad (S4)$$

$g(r)$: chord length distribution (CLD)

l_p : Porod length

a_j, g_j : fit parameters

$$l_p = \int_0^{\infty} r g(r) dr \quad (S5)$$

$$l_p = \frac{2 \int_0^{\infty} s^2 I(s) ds}{\pi^2 \lim_{s \rightarrow \infty} s^4 I(s)} \quad (S6)$$

$$l_{\text{pores}} = \frac{l_p}{1-P} \quad (\text{S7})$$

l_{pores} : average pore size

$$l_{\text{matter}} = \frac{l_p}{P} \quad (\text{S8})$$

l_{matter} : average distance between pore walls

$$\frac{S}{V} = \frac{4 P (1-P)}{l_p} \quad (\text{S9})$$

$\frac{S}{V}$: interface

$$\kappa_1 = \frac{l_c}{l_p} - 1 \quad (\text{S10})$$

κ_1 : polydispersity

References

1. Smarsly, B.; Antonietti, M.; Wolff, T. *J. Chem. Phys.* **2002**, *116*, 2618–2627.
doi:10.1063/1.1433463
2. Badaczewski, F.; Loeh, M. O.; Pfaff, T.; Dobrotka, S.; Wallacher, D.; Clemens, D.; Metz, J.; Smarsly, B. M. *Carbon* **2019**, *141*, 169–181.
doi:10.1016/j.carbon.2018.09.025