The Knudsen diffusivity for helium in the GDL is around $7.654 \times 10^{-3} \text{ m}^2 \text{ s}^{-1}$ and $1.612 \times 10^{-3} \text{ m}^2 \text{ s}^{-1}$ for the two samples. The experimental results show excellent agreement with the trend of theoretical model. For verification, the effective pore radius $r_p^{\text{eff}}$ can be obtained from the effective Knudsen diffusivity as follows:

$$D_K^{\text{eff}} = 0.89 \times \frac{2}{3} r_p^{\text{eff}} \left( \frac{8RT}{\pi M} \right)^{1/2}$$

The average effective pore radius for SIGRACET 34BA is found to be around 6.2 $\mu$m. This value is within the range of pore size distribution (1–150 $\mu$m) for gas diffusion layers [5,6]. This provides a partial validation to the idea of using binary friction model for estimating flow in porous media. Further validation can be done by using other gases of different molecular weights (see Section 4.2.3).
Are these typical values of Knudsen diffusivities? He vs O₂ values OK at least from a relative standpoint...
Table 7 shows the average permeability and effective Knudsen diffusivity in GDL and MPL of a SIGRACET 34BC porous media obtained using the BFM approach. The permeability values are slightly smaller than the ones obtained by Darcy–Forchheimer equation (see Table 6), due to accounting for Knudsen flow. The Knudsen diffusivity values in MPL are around two orders of magnitude less than in GDL, which is in the acceptable range. The use of BFM helped in accounting for the Knudsen transport through nano pores of the porous media and in turn helped in reducing the error in transport properties estimation.

Reference(s) for “acceptable range”? “nano pores”?! Is a 125-nm pore really a nanopore? What exactly is “a SIGRACET 34BC porous media”??
Why partial?

For partial validation of Knudsen diffusivity in MPL, the effective pore radius can be calculated using Eq. (17). For the SIGRACET 34BC MPL the average effective pore radius is found to be 125 nm. The calculated value is within the range of pore size distribution in MPL [5,7].
Characterization of Gas Diffusion Layers for PEMFC

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In proton-exchange membrane fuel cells (PEMFC), gas diffusion layers serve as current collectors that allow ready access of fuel and oxidant to the anode and the cathode catalyst surfaces, respectively. Critical properties of five commercial and one in-house gas diffusion layers have been characterized and compared to determine factors limiting the oxygen transport in the cathode gas diffusion layer where there is no oxygen consumption. These properties are the limiting current, electronic resistivity, fraction of hydrophobic pores, gas permeability, pore size distribution, and surface morphology. Polarization curves using air and neat oxygen were collected to determine the air-limiting currents at three operating conditions: 80°C/75% relative humidity (RH) cathode inlet, 100°C/70% RH cathode inlet, and 120°C/35% RH cathode inlet, all at atmospheric pressure. Linear empirical relationships for permeability coefficient vs. limiting current were found at all three conditions. Characterization of the gas diffusion layers by porosimetry measurement provides the pore size distribution for the gas diffusion layers, which helps in understanding the correlation between the permeability coefficient and the limiting current at the temperatures and relative humidity tested.

Ref. 6 in Pant et al. (2012)
Figure 8. Pore size distribution of all examined dual-layer gas diffusion layers: (a) GDLs based on carbon paper and (b) GDLs based on carbon cloth, normalized to the same area of 10.15 cm$^2$. 

Ref. 6 in Pant et al. (2012)
Assessing Methods and Data for Pore-Size Distribution of PEMFC Gas-Diffusion Media

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Data for hydrophilic and hydrophobic pore-size distributions are presented for two gas-diffusion media (GDM) commonly used in proton exchange membrane fuel cells (PEMFCs). The data were obtained using two measurement methods, intrusion porosimetry and the method of standard porosimetry (MSP). The use of multiple working fluids to access hydrophilic and hydrophobic pores is discussed as well as limitations associated with structural changes of the GDM during the tests. The differences in the data between the two methods are discussed for both the carbon-cloth and carbon-paper GDM and it is shown that these differences have significant implications relative to the distribution of hydrophilic and hydrophobic pores that control liquid-water transport. The analysis presented in this work shows that the MSP can lead to a more consistent interpretation of the GDM structure for materials that are compressible.
Figure 4. (Color online) Porometric curves for integral (a) and differential (b) distribution for Carbel CL at 531 kPa using MSP. Legend: total pores from MSP-O data (●), hydrophilic from MSP-W data (---), hydrophobic pores by subtraction (—).
From Fig. 4b, the volume associated to each pore size can be appreciated. The area under the curve for a specific pore-size range represents the volume associated with that range. However, because the curve is plotted in a logarithmic scale, an area in the region of larger pores represents a larger volume when compared to a similar area in the region of smaller pores. This figure shows a higher hydrophilic volume around pores of 0.1 \(\mu\)m and higher hydrophobic volume around pores of 3.5 and 26.4 \(\mu\)m.
Title: Nano-morphology of a polymer electrolyte fuel cell catalyst layer-imaging, reconstruction and analysis
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Abstract: The oxygen reduction reaction (ORR) in the cathode catalyst layer (CCL) of polymer electrolyte fuel cells (PEFC) is one of the major causes of performance loss during operation. In addition, the CCL is the most expensive component due to the use of a Pt catalyst. Apart from the ORR itself, the species transport to and from the reactive sites determines the performance of the PEFC. The effective transport properties of the species in the CCL depend on its nanostructure. Therefore a three-dimensional reconstruction of the CCL is required. A series of two-dimensional images was obtained from focused ion beam - scanning electron microscope (FIB-SEM) imaging and a segmentation method for the two-dimensional images has been developed. The pore size distribution (PSD) was calculated for the three-dimensional geometry. The influence of the alignment and the anisotropic pixel size on the PSD has been investigated. Pores were found in the range between 5 nm and 205 nm. Evaluation of the Knudsen number showed that gas transport in the CCL is governed by the transition flow regime. The liquid water transport can be described within continuum hydrodynamics by including suitable slip flow boundary conditions.

“Pores were found in the range between 5 nm and 205 nm.”

OK... but (important) details?

Why did Pant et al. (2012) not determine experimentally the PSDs of their samples?