



Fig. 12. refractive index of hafnia coatings: literature data from Fig. 2 and highest indices obtained in the present study (black bars).

6. Summary

We have presented experimental material on optical and structural properties of PIAD hafnia coatings. The main results of this study can be summarized as follows:

- PIAD of hafnium dioxide with xenon assistance results in higher refractive indices, lower band gaps and smoother film surfaces than PIAD with argon assistance.
- TEM and XRR data suggest a clear correlation between porosity, mass density, refractive index, shift and surface roughness of the layers.
- When comparing with literature data, xenon-assisted PIAD hafnia coatings come close to best values for refractive index and surface roughness published so far in the literature.

Future experiments will pursue deeper understanding of the film forming elementary processes determining energy- and momentum impact onto the substrate by detailed analysis of the plasma properties near the substrate during PIAD processes.

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