

Abstract Submitted
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Energy of the quasi-free electron in hydrogen, deuterium and oxygen: Probing intermolecular potentials within the local Wigner-Seitz model¹ KAMIL KRYNSKI, Department of Chemistry and Biochemistry and Department of Physics, Queens College – CUNY, ZACHARY STREETER², School of Sciences, University of Louisiana at Monroe, CHERICE EVANS, Department of Chemistry and Biochemistry, Queens College – CUNY and Department of Chemistry, Graduate Center – CUNY, GARY L. FINDLEY, School of Sciences, University of Louisiana at Monroe — We present for the first time the quasi-free electron energy $V_0(\rho)$ for H₂, D₂ and O₂ from gas to liquid densities, on noncritical isotherms and on a near critical isotherm in each fluid. These data illustrate the ability of field enhanced photoemission (FEP) to determine $V_0(\rho)$ accurately in strongly optically absorbing fluids (e.g., O₂) and fluids with extremely low critical temperatures (e.g., H₂ and D₂). We also show that the isotropic local Wigner-Seitz model for $V_0(\rho)$ – when coupled with thermodynamic data for the fluid – can yield optimized parameters for intermolecular potentials, as well as zero kinetic energy electron scattering lengths.

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