

What is the diameter of a water molecule?

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Chemistry 8th Edition Solutions.

A:

The diameter is about 0.29 nm.

The atomic diameter can be determined from interpolation of the effective ionic radii of the isoelectronic ions (from crystal data) of O^{2-} (2.80 Å), OH^- (2.74 Å) and H_3O^+ (2.76 Å).

Coincidentally, this diameter is similar to the length of a hydrogen bond. The water molecule (bond length 0.96 Å) is smaller than ammonia (bond length 1.01 Å) or methane (bond length 1.09 Å), with only H_2 (bond length 0.74 Å) and HF (bond length 0.92 Å) being smaller molecules.

Answer from Esteban Broitman, September 7 2008.