

## Mg-Si disorder and water content in hydrous ringwoodite

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The Mg-Si disorder observed in the hydrous ringwoodite (Kudoh et al., 2000) is evidently related to the substitution of Mg by 2H. Since there is only one independent oxygen site in the ringwoodite structure, it is impossible for hydrogen to coordinate to the oxygen without causing the local charge unbalance around the Si site. In the case that the hydrous ringwoodite is transformed from the hydrous wadsleyite in the earth's mantle, Mg-Si partial disorder may occur in order to accommodate the local charge unbalance.