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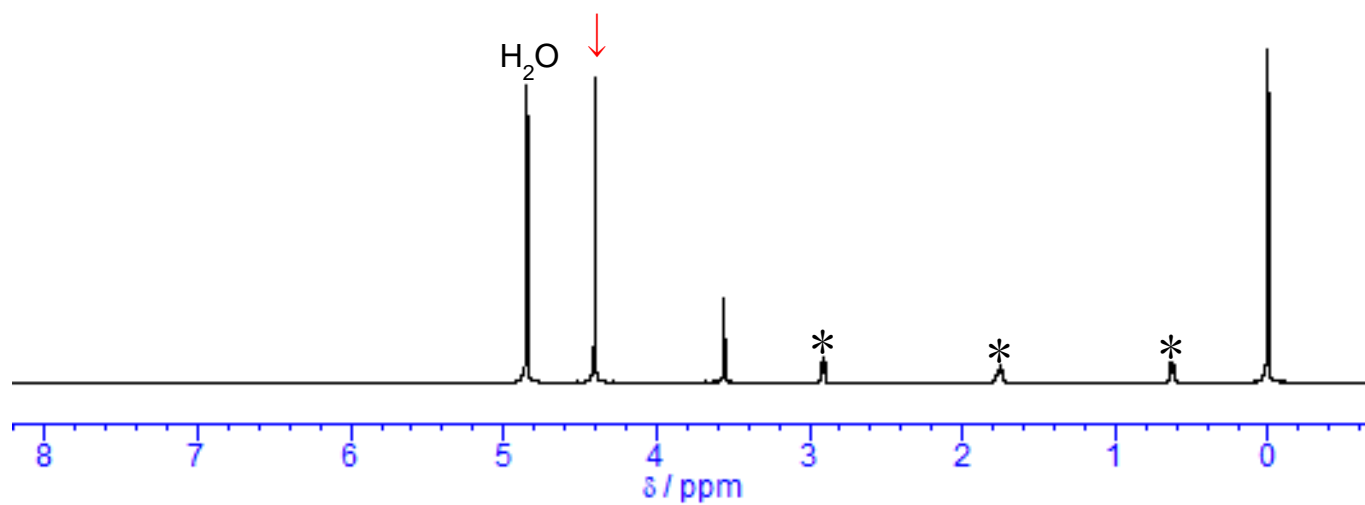
## Supporting Information

### Efficient ketose production by hydroxyapatite catalyst in a continuous flow module

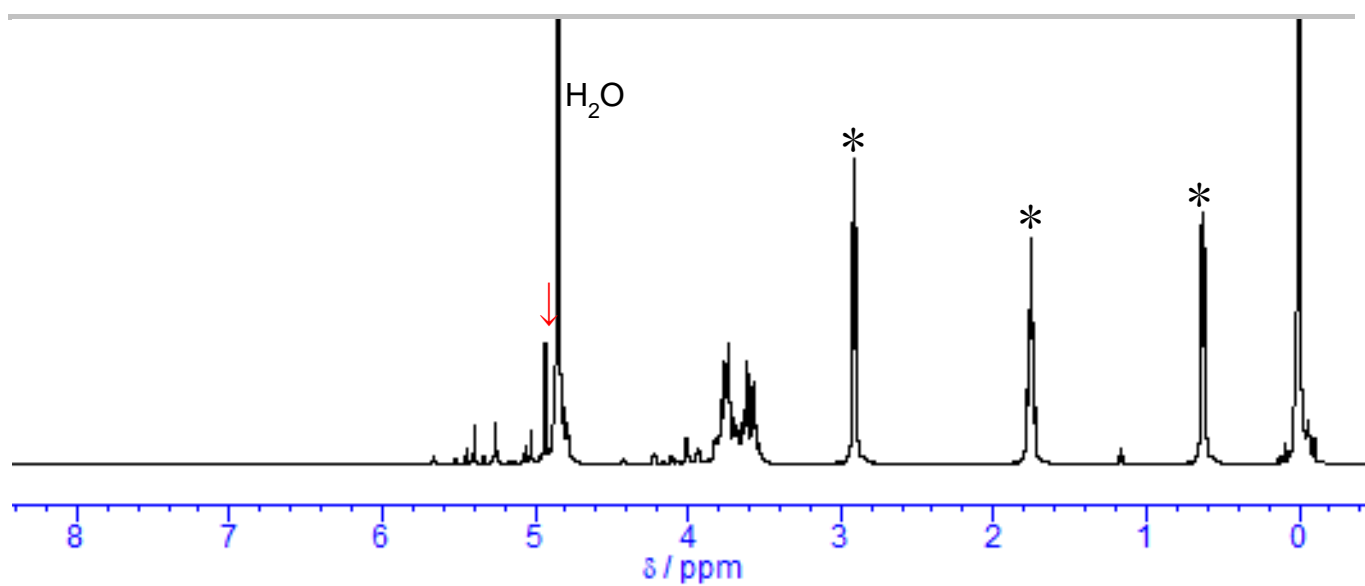
Kaho Usami, Kejing Xiao, and Akimitsu Okamoto\*

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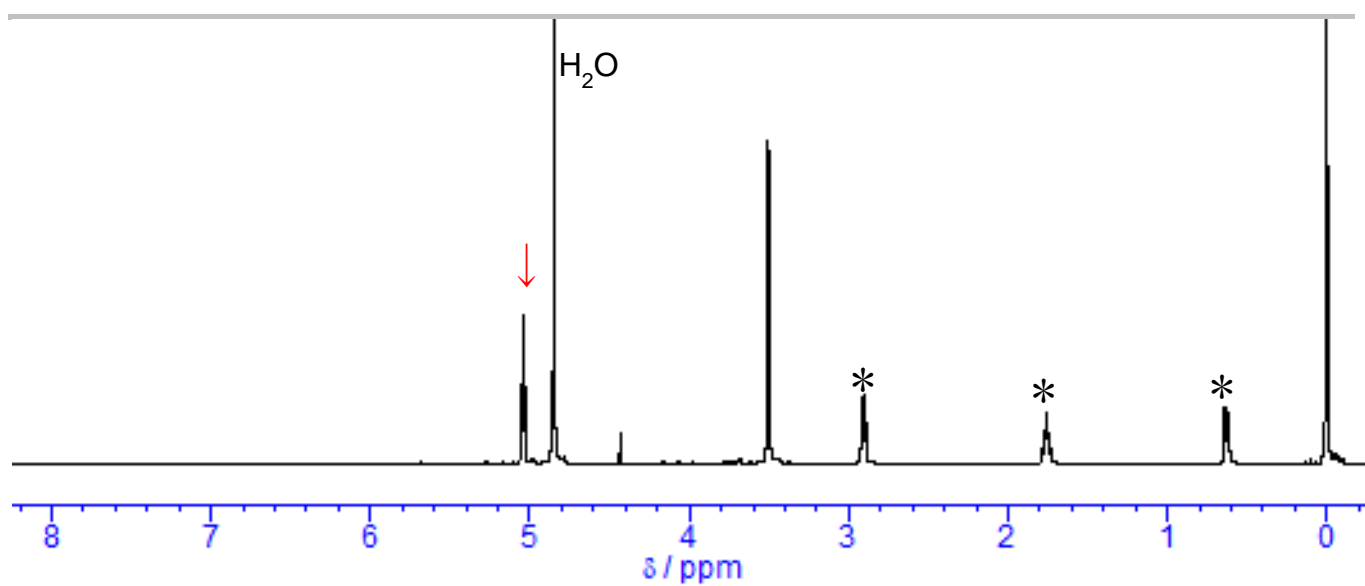
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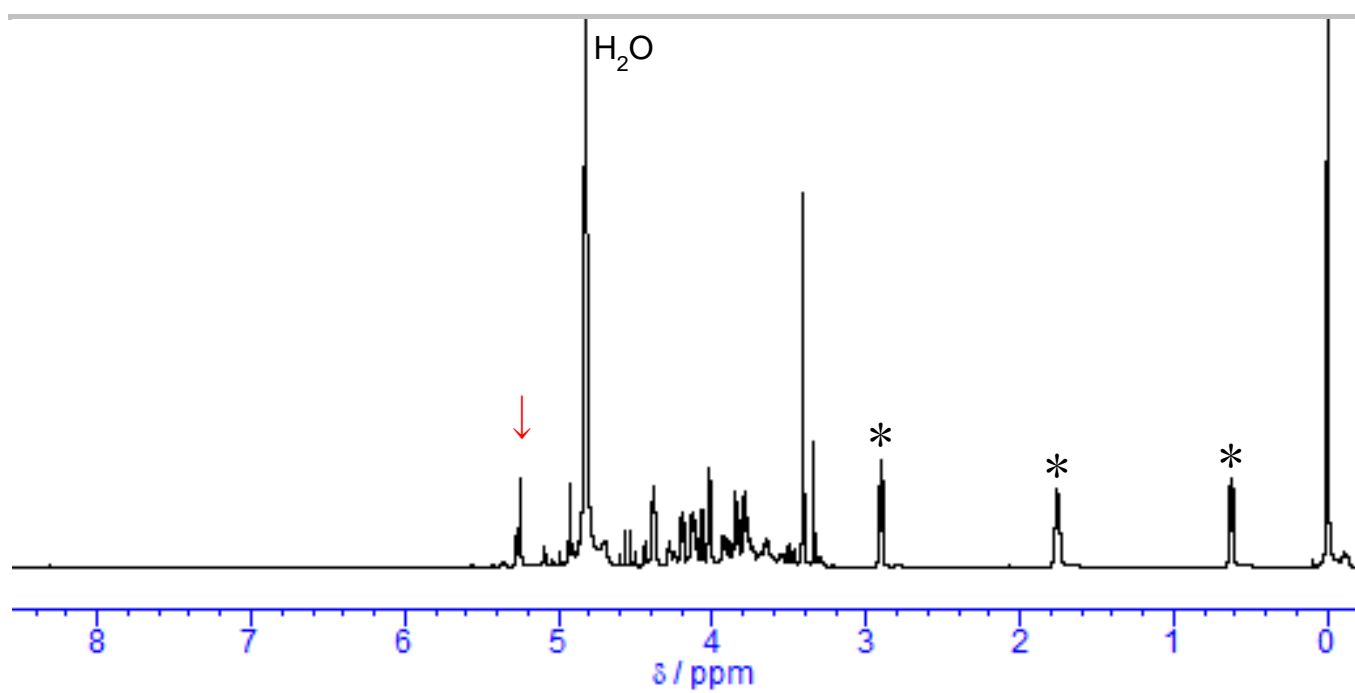
**Figure S1.** A full-range  $^1\text{H}$ -NMR chart of dihydroxyacetone in  $\text{D}_2\text{O}$ . The peaks indicated by \* and a peak at 0 ppm are derived from an internal standard 4,4-dimethyl-4-silapentane-1-sulfonic acid. A red arrow indicates a standard peak used for the calculation of the conversion yield.



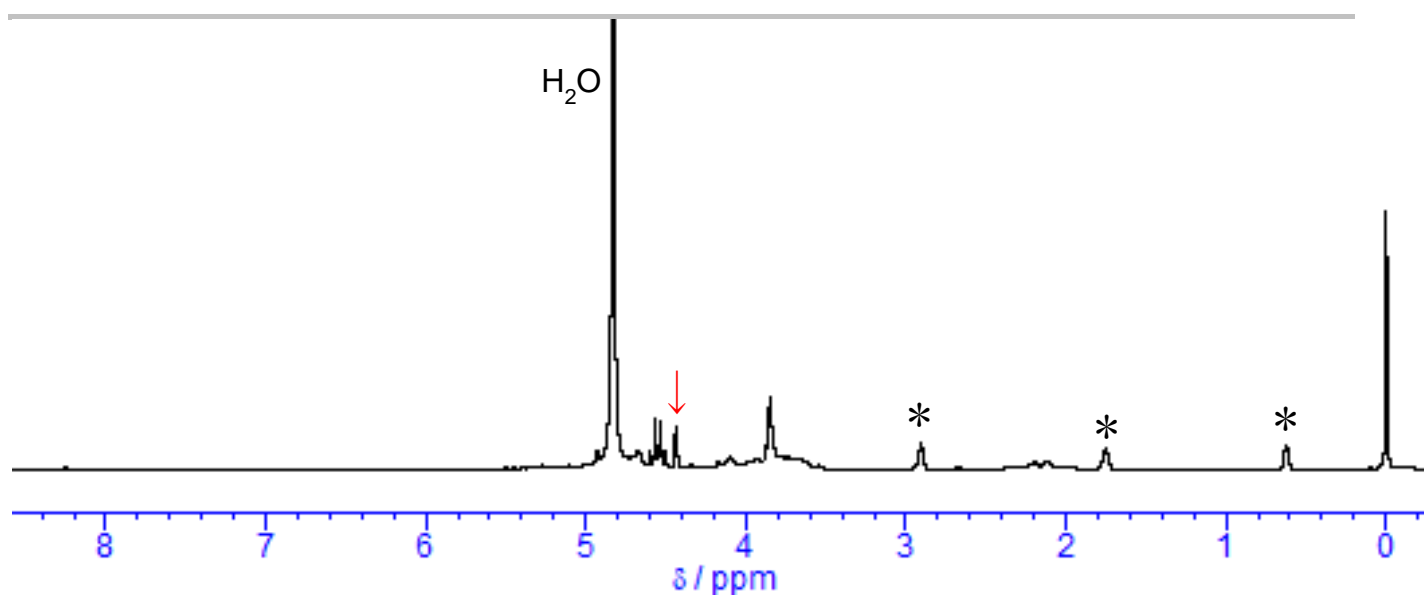
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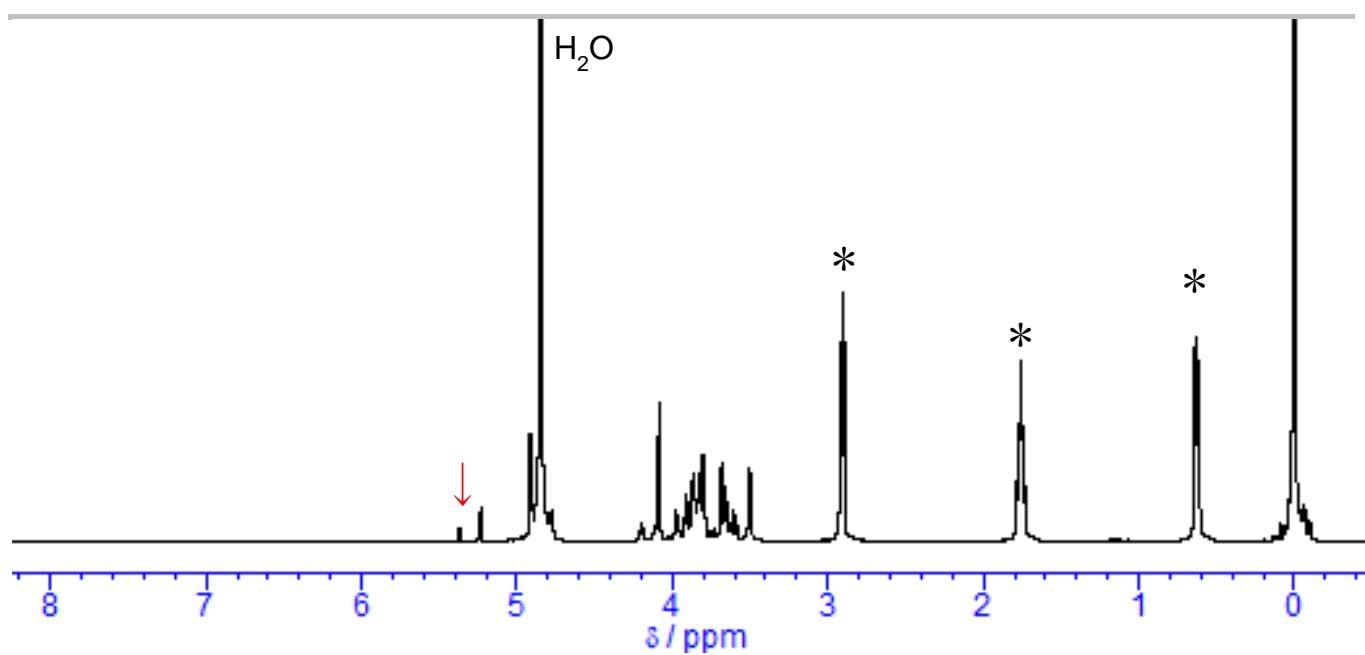
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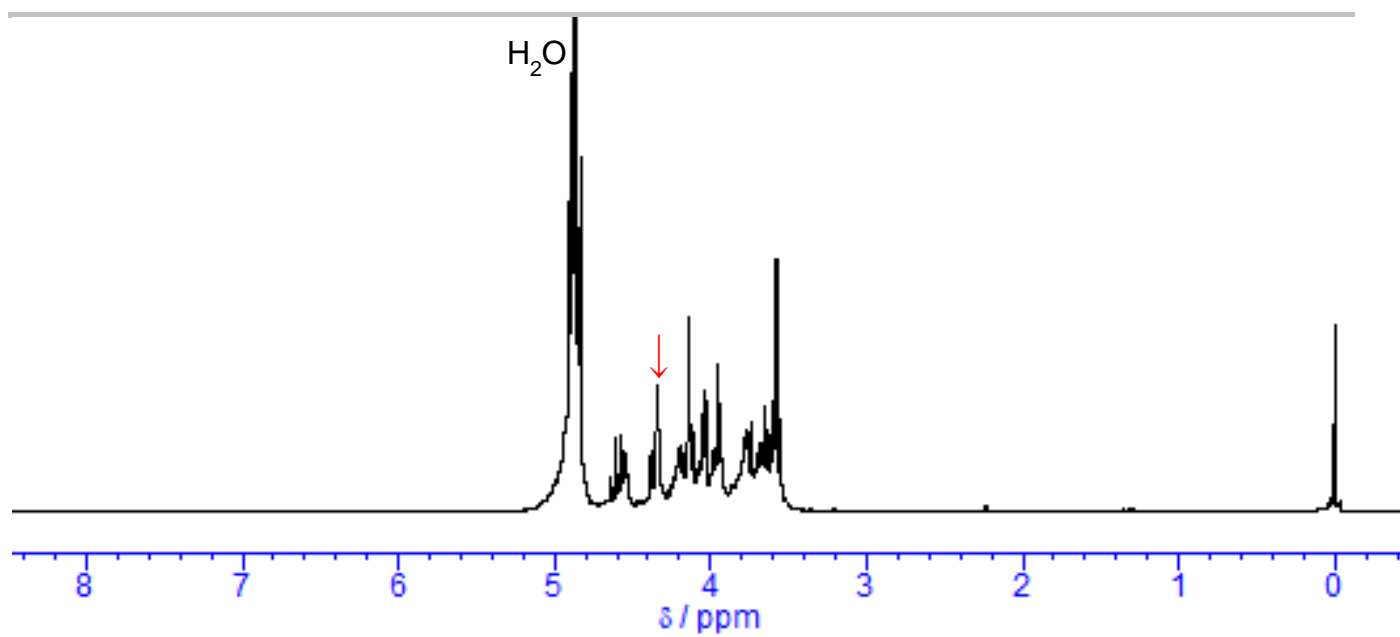
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**Figure S5.** A full-range  $^1\text{H}$ -NMR chart of erythrulose in  $\text{D}_2\text{O}$ . The peaks indicated by \* and a peak at 0 ppm are derived from an internal standard 4,4-dimethyl-4-silapentane-1-sulfonic acid. A red arrow indicates a standard peak used for the calculation of the conversion yield.

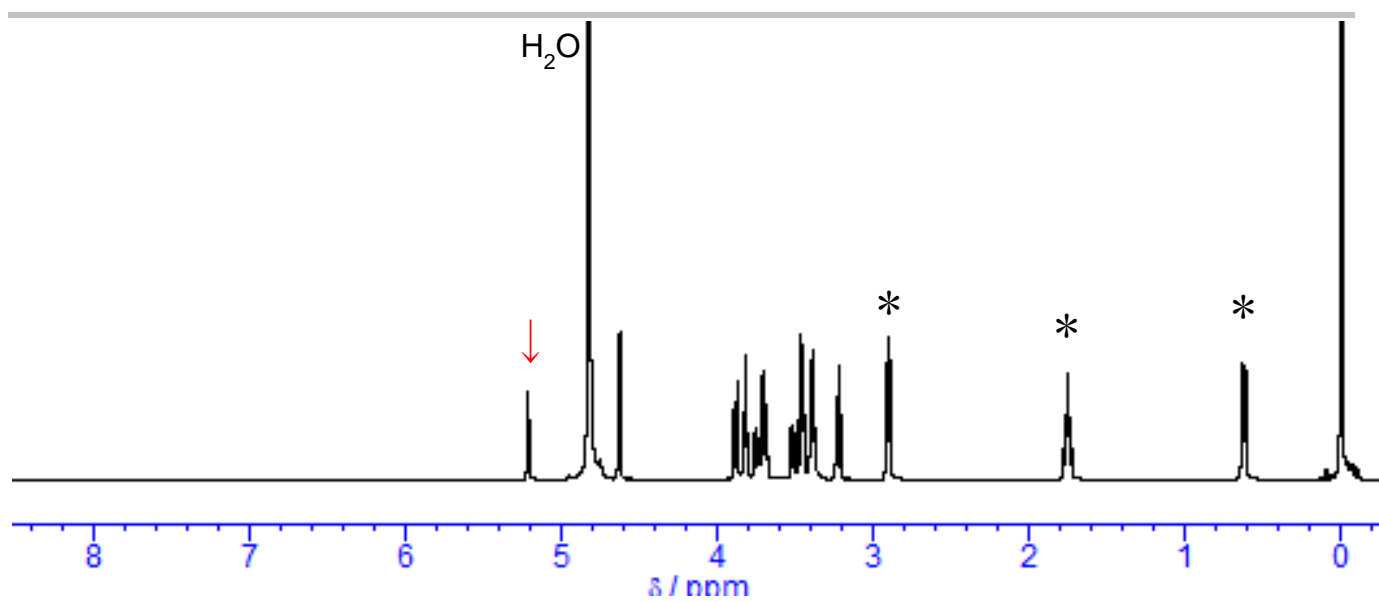


**Figure S6.** A full-range  $^1\text{H}$ -NMR chart of ribose in  $\text{D}_2\text{O}$ . The peaks indicated by \* and a peak at 0 ppm are derived from an internal standard 4,4-dimethyl-4-silapentane-1-sulfonic acid. A red arrow indicates a standard peak used for the calculation of the conversion yield.

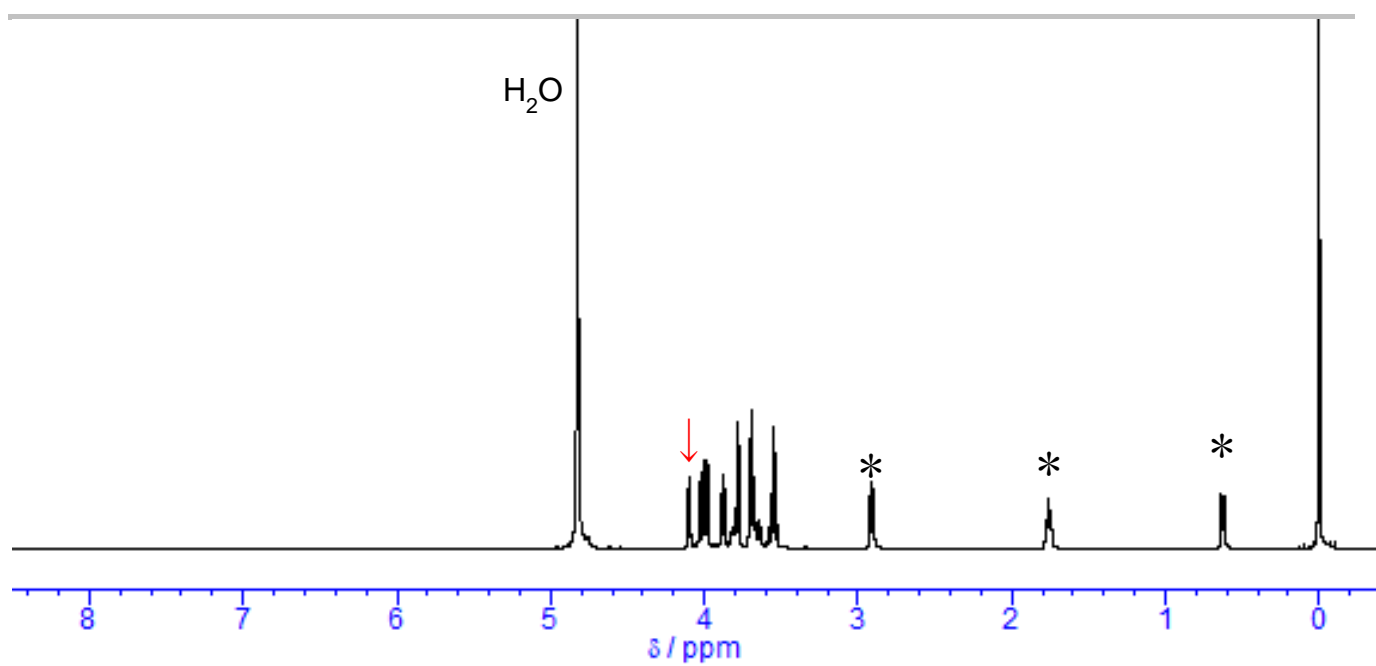


**Figure S7.** A full-range  $^1\text{H}$ -NMR chart of ribulose in  $\text{D}_2\text{O}$ . A red arrow indicates a standard peak used for the calculation of the conversion yield.

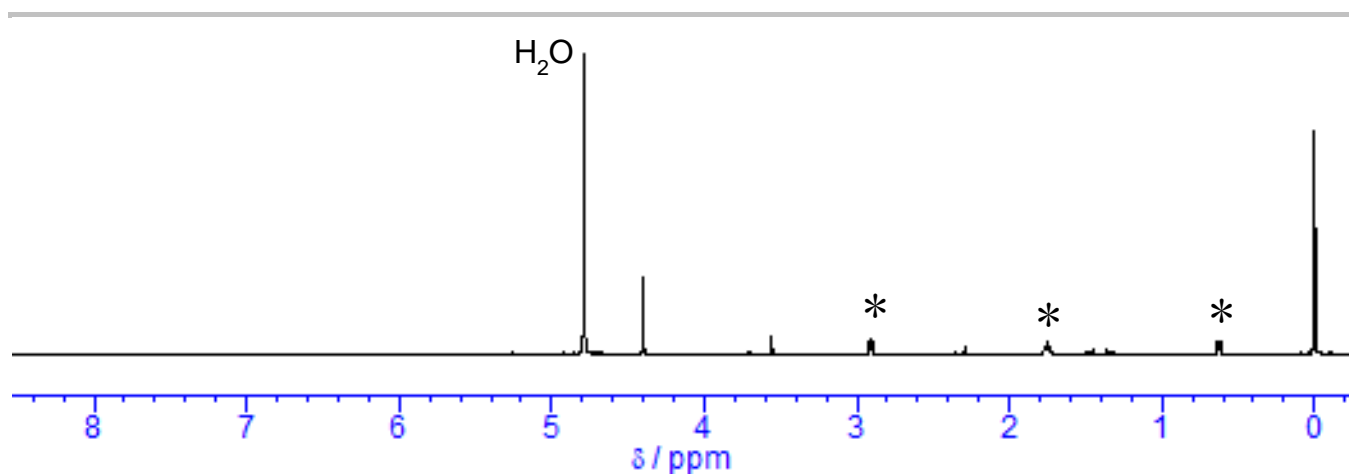




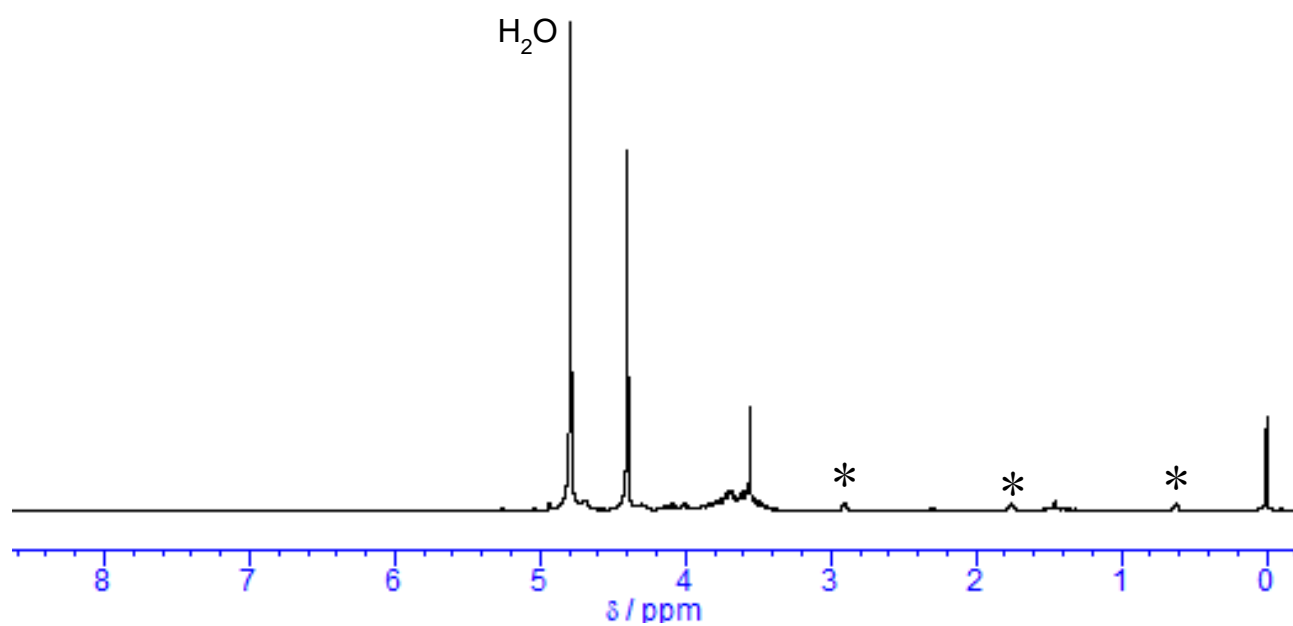
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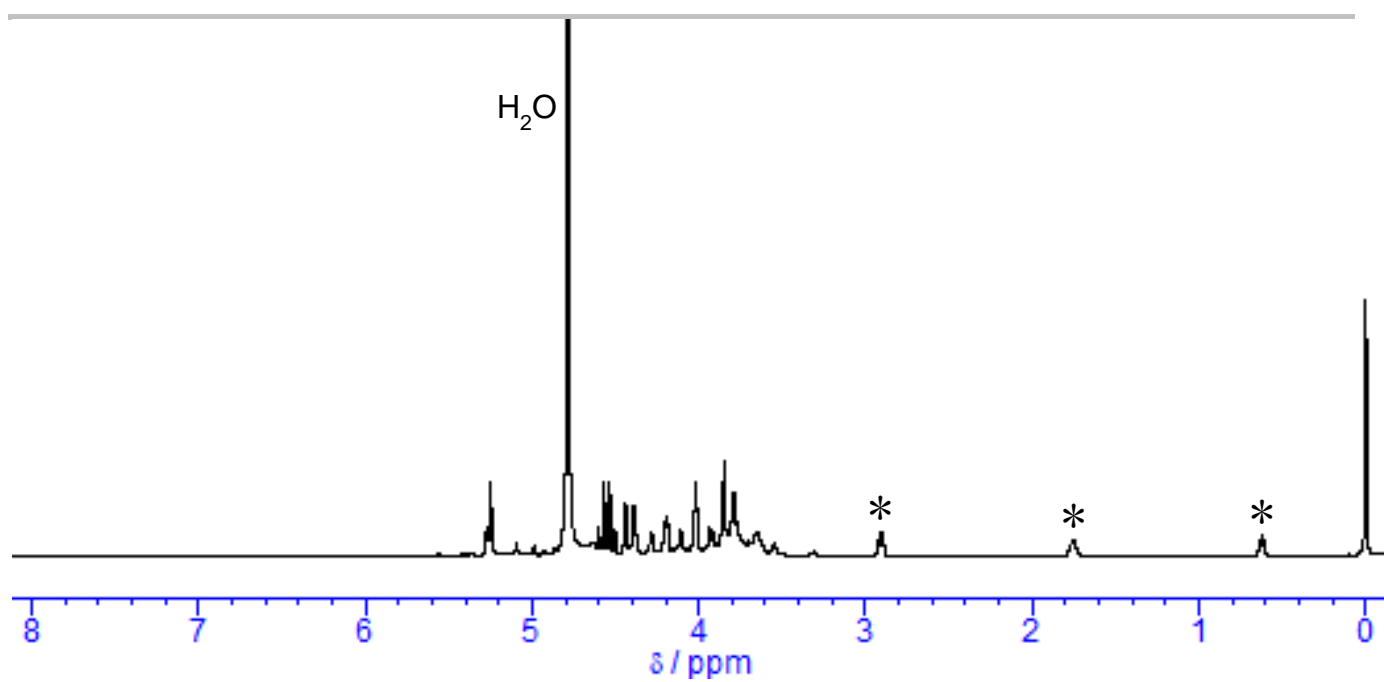
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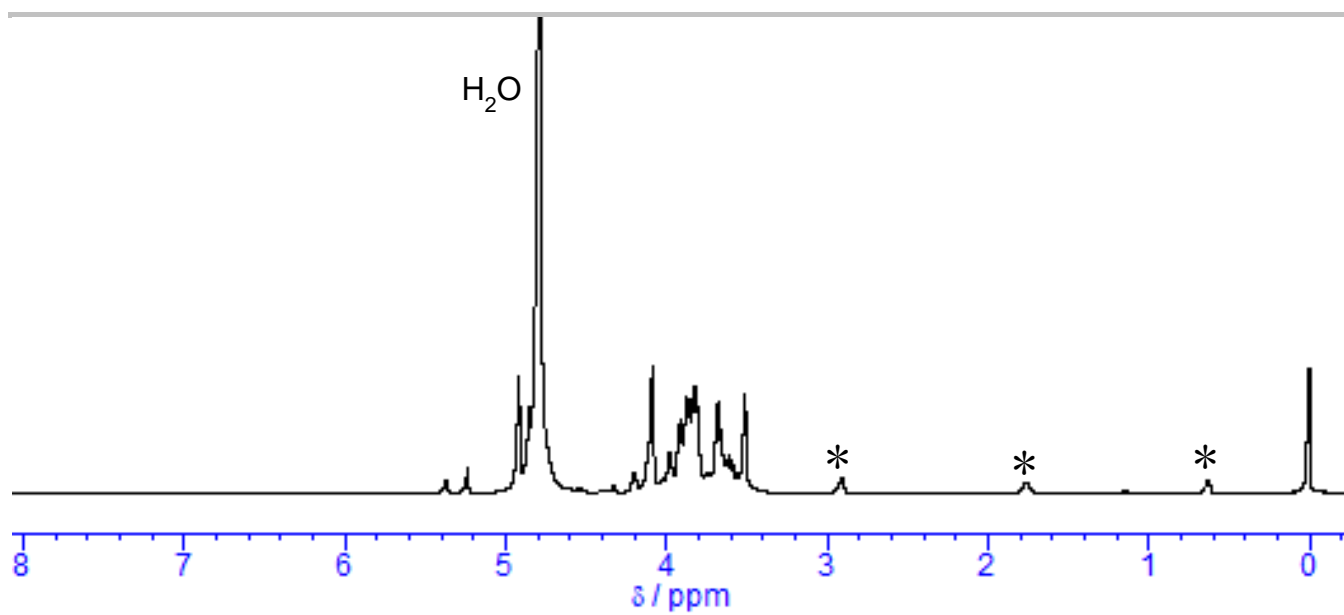
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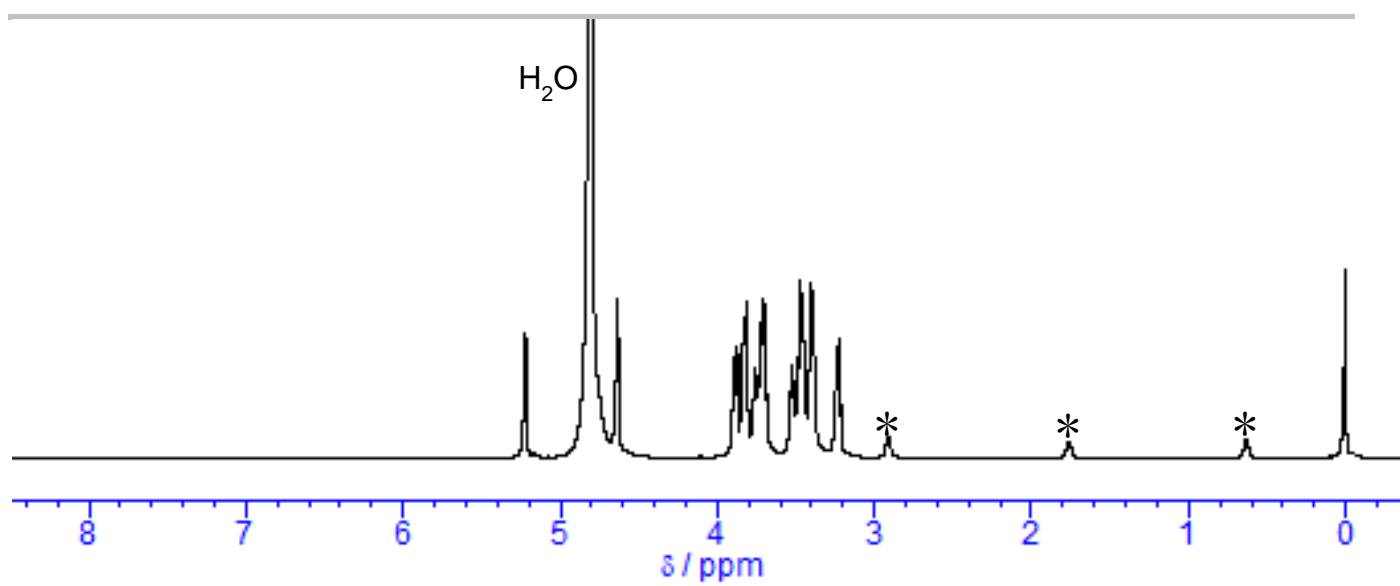
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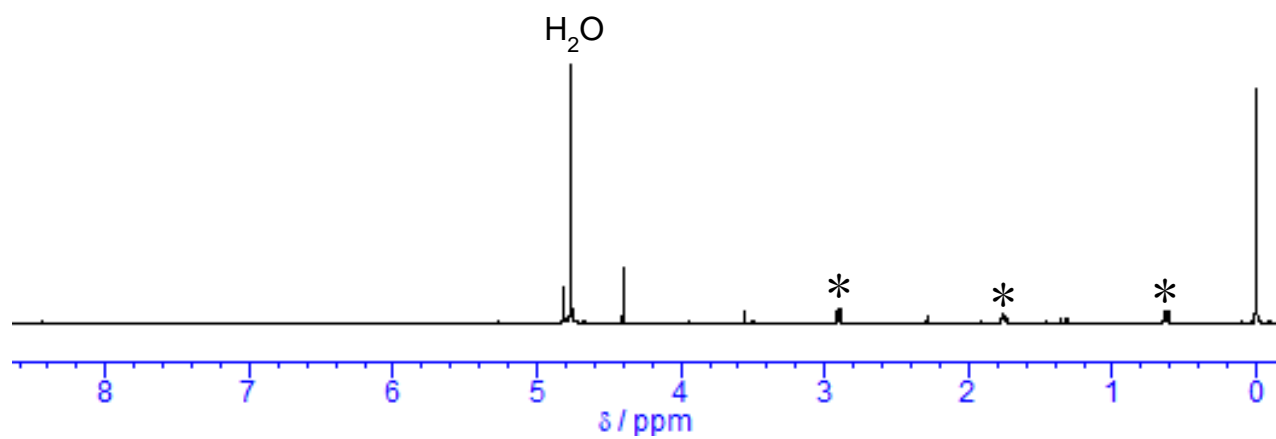
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**Figure S13.** A full-range  $^1\text{H}$ -NMR chart of the reaction products in entry 3 of Table 2. The peaks indicated by \* and a peak at 0 ppm are derived from an internal standard 4,4-dimethyl-4-silapentane-1-sulfonic acid.

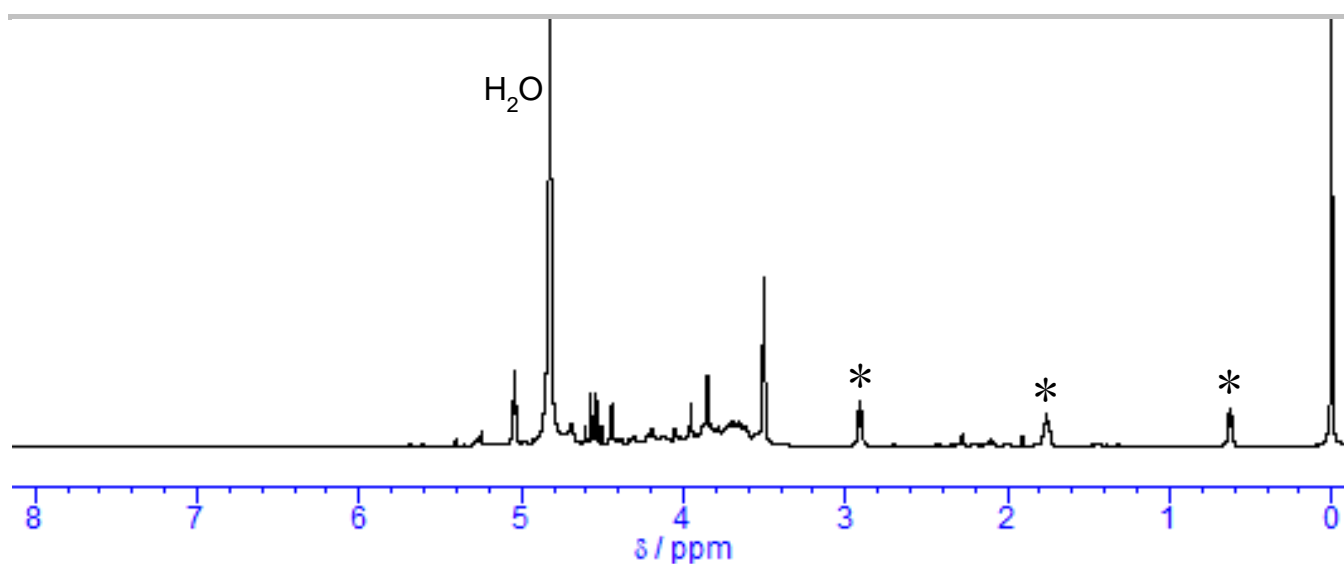


**Figure S14.** A full-range  $^1\text{H}$ -NMR chart of the reaction products in entry 4 of Table 2. The peaks indicated by \* and a peak at 0 ppm are derived from an internal standard 4,4-dimethyl-4-silapentane-1-sulfonic acid.

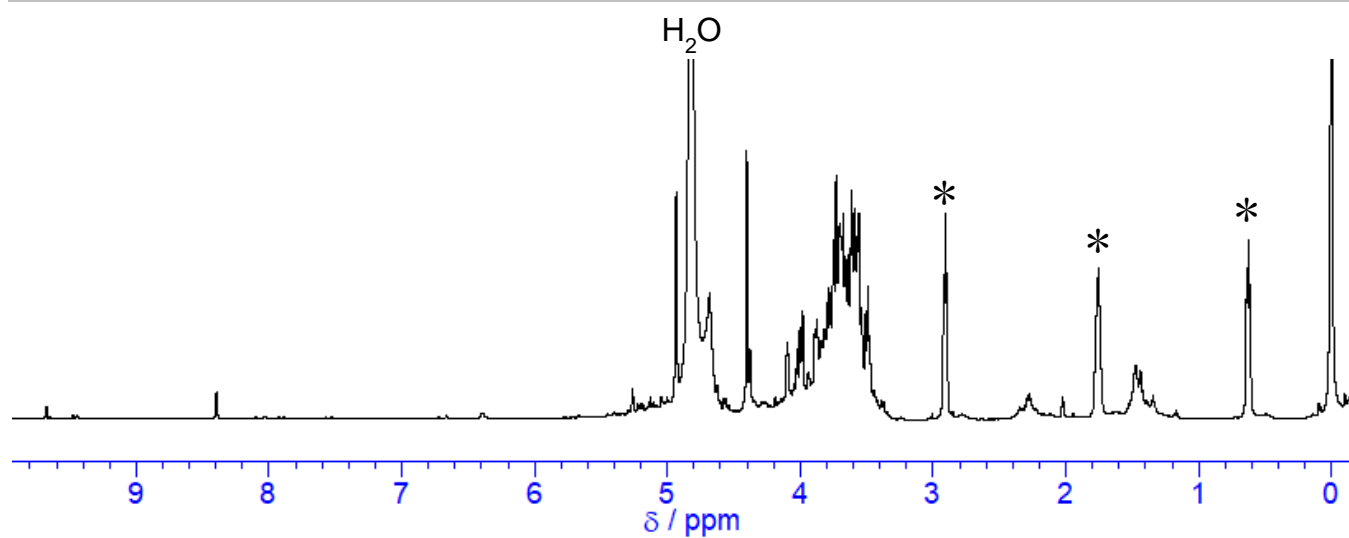


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**Figure S16.** A full-range  $^1\text{H}$ -NMR chart of the products in the self-aldol reaction of glycolaldehyde. The peaks indicated by \* and a peak at 0 ppm are derived from an internal standard 4,4-dimethyl-4-silapentane-1-sulfonic acid.



**Figure S17.** A full-range  $^1\text{H}$ -NMR chart of the HAp-catalyzed isomerization of glyceraldehyde in  $\text{D}_2\text{O}$ . The peaks indicated by \* and a peak at 0 ppm are derived from an internal standard 4,4-dimethyl-4-silapentane-1-sulfonic acid.