

Abstract Submitted  
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**Monoclinic  $\text{RbD}_2\text{PO}_4$ : room temperature synthesis, chemical and structural stability upon heating** CRISTIAN BOTEZ, MASOUD MOLLAIE, ANDRES ENCERRADO MANRIQUEZ, MICHAEL EASTMAN, University of Texas at El Paso — Monoclinic  $\text{RbD}_2\text{PO}_4$  polycrystals (DRDP) were synthesized via the room temperature crystallization of  $\text{RbH}_2\text{PO}_4$  (RDP) dissolved in  $\text{D}_2\text{O}$ . Powder x-ray diffraction (XRD) data collected at  $T=25^\circ\text{C}$  indicate that this deuterated compound crystallizes in spacegroup  $\text{P2}_1/\text{m}$  with unit cell parameters  $a=7.688\text{\AA}$ ,  $b=6.192\text{\AA}$ ,  $c=4.781\text{\AA}$  and  $\beta=109.02^\circ$ , and is *isomorphic* with the intermediate-temperature phase of its hydrogenated counterpart RDP. We found no evidence of previously reported [*Phase Transitions* **80**, 17 (2007)] polymorphic phase transition in DRDP upon heating from room temperature to  $210^\circ\text{C}$ . All lattice parameters vary smoothly within this temperature range, demonstrating that the  $\text{P2}_1/\text{m}$  phase persists upon heating. In addition, the unit cell volume of monoclinic DRDP is  $\sim 1\%$  greater than that of its RDP polymorph at all temperatures between  $150^\circ\text{C}$  and  $210^\circ\text{C}$ , which indicates the absence of significant deuterium-hydrogen isotope exchange. Further heating to  $240^\circ\text{C}$  leads to the thermal decomposition of the title compound via dehydration.

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