

# A Second Modification of Mercury(I) Orthoarsenate(V): Preparation and Crystal Structure of $\beta\text{-(Hg}_2\text{)}_3\text{(AsO}_4\text{)}_2$

Matthias Weil

Institute for Chemical Technologies and Analytics – Division of Structural Chemistry –  
Vienna University of Technology, Getreidemarkt 9/164-SC, A-1060 Vienna, Austria

Reprint requests to Dr. M. Weil. E-mail: mweil@mail.zserv.tuwien.ac.at

Z. Naturforsch. **59b**, 859 – 864 (2004); received April 13, 2004

Light-yellow crystals of a second modification of mercury(I) orthoarsenate(V),  $\beta\text{-(Hg}_2\text{)}_3\text{(AsO}_4\text{)}_2$ , were obtained during a diffusion-controlled precipitation reaction starting from diluted solutions of  $\text{Hg}_2\text{(NO}_3\text{)}_2$ ,  $\text{Hg(NO}_3\text{)}_2$ , and  $\text{H}_3\text{AsO}_4$ . The crystal structure was determined from a single crystal X-ray diffraction data set. The previously reported crystal structure of synthetic *chursinite*,  $\alpha\text{-(Hg}_2\text{)}_3\text{(AsO}_4\text{)}_2$ , has also been re-investigated and refined with better accuracy and precision. Both phases crystallize in space group type  $P2_1/c$  (no. 14) [ $\alpha$ - ( $\beta$ -):  $Z = 2$  (4),  $a = 8.7915(6)$  (10.2034(18)),  $b = 5.0699(4)$  (8.5875(14)),  $c = 15.6839(10)$  (13.5172(19)) Å,  $\beta = 128.761(1)$  (101.016(3))°, 1661 (3528) structure factors, 74 (146) parameters,  $RF^2 > 2\sigma(F^2)] = 0.0195$  (0.0492)] and are made up from  $\text{Hg}_2^{2+}$  dumbbells and  $\text{AsO}_4^{3-}$  tetrahedra as the main building units, but the topologies of the structures are quite different.

*Key words:* Mercury, Arsenate, Crystal Structure, Polymorphism