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**Supporting information for article:**

**$\alpha$ -Nickel sulphate hexahydrate crystals: relationship of growth conditions, crystal structure and properties**

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## Supporting Information

### Microhardness studies

To study of the Vickers microhardness ( $H$ ) and define the average values of the crack lengths ( $l$ ) the samples from four  $\alpha$ -NSH crystals were made. The samples were prepared from the (001) growth sector as (001)-plates cleaved along cleavage planes. When indenting of the (001)-surface by the Vickers diamond pyramid the samples were orientated so that the imprint diagonal  $d$  to be measured was parallel to the direction [110]. Thus the cracks that extend to the surface from the corners of the indent along [110] are formed. Their lengths were measured similarly to radial cracks: from the corner of the indent separately for each of the four directions. Microhardness was calculated in the common way for the Vickers pyramid from  $d$  measurements and working load  $P = 0.16$  N. Averaging of  $H$  and  $l$  was carried out according to the results of measurements of 20 prints made on each of the samples (Table 1). The statistical standard errors of the mean  $H$  and  $l$  within such a sample were 2% and 4.5%, respectively.

Table 1 shows the average values of microhardness  $H$ , crack length  $l$ , both for individual samples and grouped by crystals and standard deviations of these values. The results interesting for comparison of mechanical properties of crystals grown from solutions with and without acid are highlighted in bold. As one can see from Table 1 the microhardness of  $\alpha$ -NSH crystals grown from aqueous solutions with the addition of sulfuric acid and without acid coincides with good accuracy ( $H = 0.76$  GPa in both cases)

**Table 1** Summary table of Vickers microhardness values  $H$  and mean crack length  $l$  for cleavage plane (001) of the  $\alpha$ -NSH crystals grown without acid and with the addition of sulfuric acid (working load  $P = 0.16$  H)

Crystal	$H$ , GPa	Mean $H$ , GPa	Standard deviation $H$ , %	$l$ , $\mu\text{m}$	Mean $l$ , $\mu\text{m}$	Standard deviation $l$ , %
NSH1	0.765	<b>0.761</b>	<b>0.84</b>	16.97	<b>17.33</b>	<b>2.01</b>
	0.756			17.69		
NSH2(1)	0.744	<b>0.760</b>	<b>4.58</b>	17.06	<b>15.90</b>	<b>6.47</b>
NSH2(2)	0.824			14.41		
	0.767			16.49		
NSH2(3)	0.723			15.39		
	0.756			16.13		