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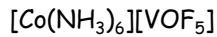
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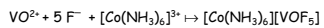
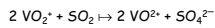
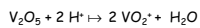
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Pri vaji bomo pripravili pentafluoridooksidovanadat(IV) z velikim kationom  $[\text{Co}(\text{NH}_3)_6]^{3+}$

Potekajo reakcije:




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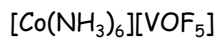
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$\text{V}^{4+}$  je v  $\text{VO}^{2+}$  zelo stabilen; dvojna vez  $\text{V}=\text{O}$

$\text{V}^{4+}$   $[\text{Ar}] 3d^1$ .

Fluoridooksidovanadati(IV) lahko nastopajo v različnih stehiometrijah:

pentafluoridooksidovanadati(IV)  $[\text{VOF}_5]^{3-}$ ,  
tetrafluoridooksidovanadati(IV)  $[\text{VOF}_4]^{2-}$  in  
trifluoridooksidovanadati(IV)  $[\text{VOF}_3]^-$ .

Osnovna strukturna enota v  $[\text{VOF}_5]^{3-}$  so izolirani oktaedri, v  $[\text{VOF}_4]^{2-}$  pa so oktaedri povezani prek oglišč v verige.

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## Reagenti

$V_2O_5$   
 $SO_2(g)$   
 HF (48% in razredčena)  
 $[Co(NH_3)_6]Cl_3$   
 KOH (raztopina za nevtralizacijo  $SO_2$ )

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## Karakterizacija

Rentgenska praškovna analiza  
 izračun parametra  $a$  in gostote v kubični osnovni celici  $[Co(NH_3)_6][VOF_3]$

Infrardečo spektroskopijo (v Nujolu)  
 N-H v molekuli  $NH_3$  valenčna 3300 - 3100  $cm^{-1}$  in upogibna ~1600 in ~1340  $cm^{-1}$ ,  
 valenčna nihanja za V=O (~ 905  $cm^{-1}$ ) in  
 V-F (~ 470  $cm^{-1}$ )

Termična analiza  
 $CoF_2$  in  $VF_3$  ali  $Co$  in  $VF_3$

Magnetne meritve  
 $\mu_{eff}$  in št. neparnih elektronov

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## Kubični kristalni sistem, $a$ in gostota

Indeksiranje medravninskih razdalj  $d$  za NaCl.

$d$	$1/d^2$	$K = (1/d^2)/(1/d^2_{min.})$	$K \times l = N$	$hkl$	$a/\text{Å}$
3,26	0,0941	1	3	1 1 1	5,65
2,82	0,1258	1,337	4	2 0 0	5,64
1,994	0,2515	2,673	8	2 2 0	5,64
1,628	0,3774	4,012	12	2 2 2	5,64
1,410	0,5030	5,345	16	4 0 0	5,64
1,261	0,6289	6,683	20	4 2 0	5,64

Dimenzija stranice  $a$  v kubični osnovni celici.

$$a = d\sqrt{h^2 + k^2 + l^2} = d\sqrt{N}$$

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