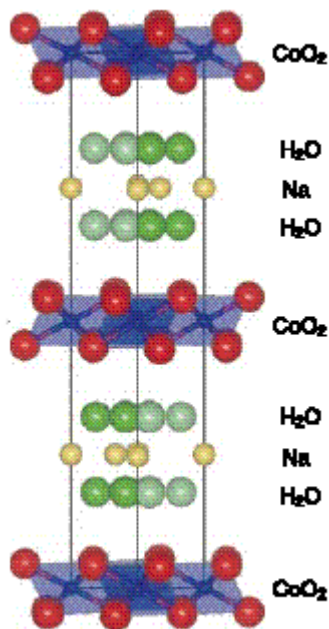


New superconducting material

$\text{Na}_x\text{CoO}_2 \cdot y\text{H}_2\text{O}$ 04-03-02

1. Structure



この図は[NAT4220053] より引用したものです。

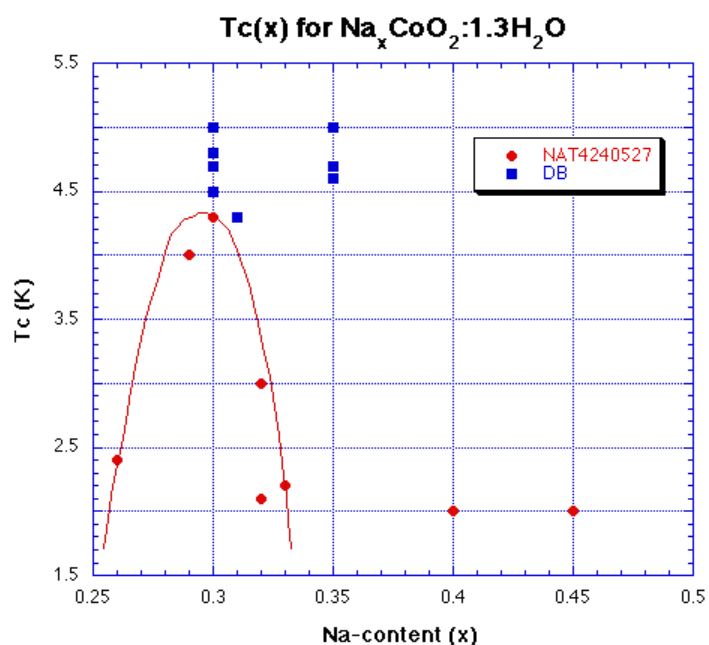
space group: $P6_{3}/mmc$

lattice constant $a = 2.8230$

$c = 19.6207$

(日本結晶学会誌 45(2003)140)

2. $T_c(x)$



図の DB データは x の値が測定されていないものが多い。試料の品質、測定精度の向上に伴って超伝導相は $x=0.3$ 近傍の狭い範囲となる[NAT4240527]

3. dTc/dP

-0.107 K/GPa [P068132504]

4. isotope effect

H₂O を D₂O で置換した試料の T_c 測定 : { x,y }

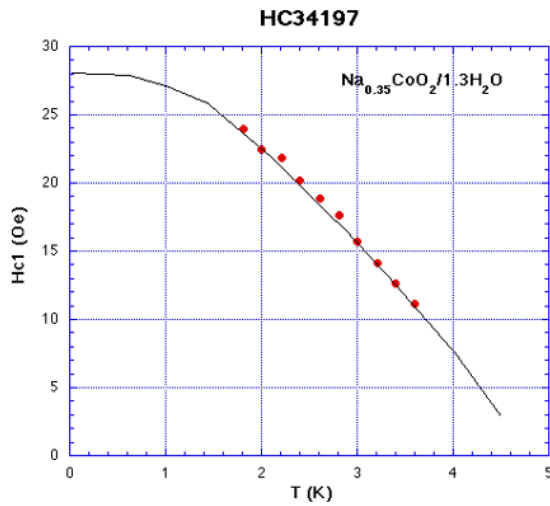
{0.3,1.4} T_c = 4.5 K for D₂O [L091217001]

{0.31,1.25} T_c = 4.5 K for D₂O [P068214517]

5. Superconducting properties.

Table 1. H_{c1}(0), H_{c2}(0), dH_{c2}/dT, coherence length ξ(0), penetration depth λ(0).

H _{c1} (0)	H _{c2} (0)	dH _{c2} /dT	ξ(0)	λ(0)	reference
Oe	T	T/K	Å	Å	
28	61	-19.3	23.2	5680	P068132507
13	10	-3.4	57	7900	JPC0150519



H_{c1}(T) [P068132507]

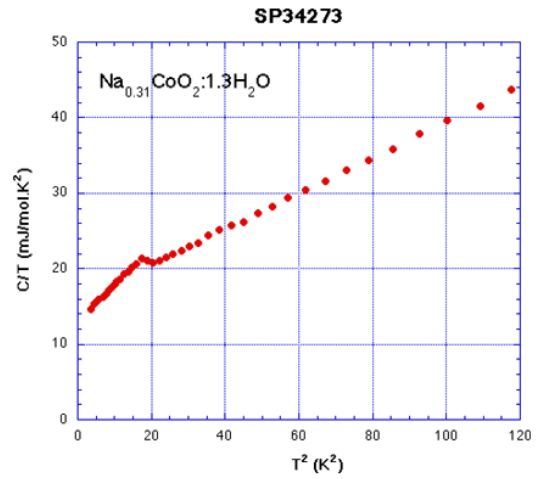
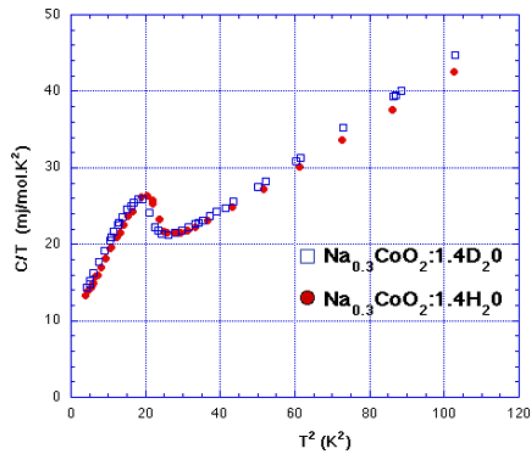
10. energy gap

2 Δ/kT_c 3.6 NMR [JPS0722453]

3.5 NQR [JPS0723041]

2.71 specific heat [JPC0150519]

11. specific heat



12. electronic specific heat coefficient

15.9 mj/mol.K²

[JPC0150519]

16.1

[L091217001]

16.4 for 1.4D₂O

[L091217001]

13. Debye temperature

391 K

[JPC0150519]

14. magnetic properties

Curie Temp. = 1.7 K

[JPC0150519]

15. mechanical properties

bulk modulus B = 43 GPa

[P068180505]