

No. 43A-13 (NH₄)₂Cd₂(SO₄)₃, Ammonium cadmium sulfate (ACS)*(M* = 549.09; [*D*: 557.14])

1a	Ferroelectricity in (NH ₄) ₂ Cd ₂ (SO ₄) ₃ was discovered by Jona and Pepinsky in 1956.		56Jon
b	phase	II	I
	state	F ^{a)}	P ^{a)}
	crystal system	monoclinic	cubic ^{a)}
	space group	P2 ₁ – C ₂ ^{c)}	P2 ₁ 3 – T ^{d)b)}
	Θ [°C]	–184 ^{a)} –178 ^{b)} –181 ^{c)} –181 [D: –175] ^{d)}	
	Transition scheme: Table 43A-13-001.		
	Transition temperature: Table 43A-13-002; see also Table 43A-2-001 in No. 43A-2.		
	Θ _f = 88.7 K by optical birefringence, X-ray diffraction.		
	The lowest Raman mode suggests that there exists an antidistortive transition at 162 K.		
	See Fig. 43A-13-026 in 10a.		
	Two transitions at 93 K and 102 K were suggested by X-ray diffraction.		
	ρ = 3.28 · 10 ³ kg m ^{–3} .		
	Transparent and colorless.		
	P _s [010].		
2a	Crystal growth: evaporation method.		62Jon
	Synthesis and characterization: see		89Gar1, 89Gar2, 89Gar3
	b Phase diagram of (NH ₄) ₂ SO ₄ –CdSO ₄ –H ₂ O system: Fig. 43A-13-001.		
	Crystal habits: Fig. 43A-13-002.		
3a	Unit cell parameter: a = 10.350(5) Å.		78Kob
b	Z = 4.		
	Crystal structure: Table 43A-13-003, Table 43A-13-004; Fig. 43A-13-003.		
4	Thermal expansion: Fig. 43A-13-004, Fig. 43A-13-005.		
5a	Dielectric constant: Fig. 43A-13-006, Fig. 43A-13-007.		
	Pressure effect on the ferroelectric transition temperature:		
	(dΘ _f /dp) _{p=0} = 3.35 · 10 ^{–8} K Pa ^{–1} ;		72Glo1
	Fig. 43A-13-008.		
c	Spontaneous polarization: Fig. 43A-13-009.		
	Coercive field: Fig. 43A-13-010.		
6a	Transition heat and entropy: Table 43A-13-005;		
	see also Table 43A-13-002 in 1b.		
	Heat capacity: Fig. 43A-13-011, Fig. 43A-13-012, Fig. 43A-13-013; see also		73Fra
7b	Electrostrictive constant: Fig. 43A-13-014.		
8a	Elastic compliance: Fig. 43A-13-015.		
	Elastic constant determined by Brillouin scattering measurement [$\cdot 10^{10}$ Nm ^{–2}]:		75Sai
	c ₁₁ = 7.66, c ₁₂ = 2.95, c ₄₄ = 2.04.		

9a	Refractive index: Fig. 43A-13-016; see also Table 43A-2-006, Table 43A-2-007 in No. 43A-2. Birefringence: Fig. 43A-13-017; see also Optical absorption: Fig. 43A-13-018. See also Fig. 43A-14-011 in No. 43A-14.	73Glo
b	Electrooptic effect: Fig. 43A-13-019, Fig. 43A-13-020; see Table 43A-2-006 in No. 43A-2. See also	64Buh, 69Vas
c	Piezoelectric constant: $ p_{11} = 0.175(5)$, $ p_{21} $ or $ p_{31} = 0.166(5)$, $ p_{55} = 0.025$ for $\lambda = 633$ nm determined by Dixon-Cohen method.	74Kon
d	Optical activity: Fig. 43A-13-021, Fig. 43A-13-022. Optical rotatory power: see Fig. 43A-14-013 in No. 43A-14 and Fig. 43A-2-005 in No. 43A-2.	
10a	Raman scattering: Table 43A-13-006, Table 43A-13-007, Table 43A-13-008, Table 43A-13-009, Table 43A-13-010, Table 43A-13-011; Fig. 43A-13-023, Fig. 43A-13-024, Fig. 43A-13-025, Fig. 43A-13-026; see also	76Faw, 83Latl
b	Brillouin scattering: see 8a.	
13a	NMR: Fig. 43A-13-027, Fig. 43A-13-028.	
b	ESR of Mn ²⁺ : Table 43A-13-012, Table 43A-13-013, Table 43A-13-014; Fig. 43A-13-029. ESR of Tl: Table 43A-13-015. ESR of Cu ²⁺ : $g_{\parallel} = 2.027$, $g_{\perp} = 2.283$, $A_{\parallel} = 95 \cdot 10^{-2} \text{ m}^{-1}$, $A_{\perp} = 31 \cdot 10^{-2} \text{ m}^{-1}$. ESR of Cd ²⁺ : Fig. 43A-13-030. ESR of VO ²⁺ : see ESR of Fe ³⁺ : see ESR of Cr ³⁺ : Spin Hamiltonian parameters: $g = 1.961(1)$; $D = 65.0(2) \text{ mT}$; $E = 15.3(2) \text{ mT}$. ESR of SO ₃ ⁻ and SO ₄ ⁻ in X-ray irradiated crystals: see	82Mou 84Bab 92Bot 89Bab 89Bab
15a	Domain structure was observed by polarized light; 180° domains are separated by (100) walls; 90° domains are separated by (570) walls. Domain pattern: Fig. 43A-13-031, Fig. 43A-13-32.	73Glo