HIGH-TEMPERATURE SUPERCONDUCTORS

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The following tables list selected physical properties of most known high-temperature superconductors as of the date of compilation in 2020. The classification as a "high-temperature" superconductor is open to some degree of ambiguity. Naming was driven by excitement at the prospect of operation above the boiling point of liquid nitrogen (~77 K). However, the reality of superconductor applications today is that few can operate in this regime, while it is clearly illogical to exclude closely related materials of the same family that fall below such an arbitrary cut-off. Instead, we adopt here the classification that a "high-temperature" superconductor is a non-BCS type superconductor that is thereby able to operate beyond the BCS temperature limit of ~30 K. Until relatively recently, this limited the known materials to cuprate compounds; however, this has now been extended first by magnesium diboride and then by the extensive families of iron-based superconductors. We do not, however, include all unconventional superconductors, intentionally excluding those isolated examples and families where no related material is able to superconduct at an elevated temperature. Notably, this excludes all the so-called "heavy fermion" superconductors thus far discovered. For the same reason, we also exclude the organic superconductors, which are featured elsewhere in this volume.

The high-temperature superconductors are presented here in a series of tables, one for each distinctly identifiable family. Table 1 lists the detailed superconducting properties of a select number of materials drawn from families that have been studied in depth due to either importance or accessibility. Table 2 contains the "214" phases including $(La,Ba)_2CuO_4$, which was the original 1986 Bednorz and Müller discovery of high-temperature superconductivity. Here are also found the rare examples of electron-doped cuprates. Table 3 presents the rare-earth barium cuprates, including the most famous of the high-temperature superconductors, $YBa_2Cu_3O_7$. These materials are the core constituents of so-called second-generation commercial high-temperature superconducting wires. Table 4 supplements these materials with derivatives having missing rare-earth planes, while Tables 5 and 6 feature two distinct homologous series of cuprates based on Hg, Tl, Pb, Bi, and others, of which $Bi_2Ba_2Ca_2Cu_3O_{10}$ is the material used in the production of first-generation commercial high-temperature superconducting wires. Tables 7 and 8 move from the cuprates to the chalcogenide and pnictide families of iron-based superconductors, respectively, and Table 9 contains the few other non-cuprate high-temperature superconductors known, including MgB_2.

In compiling and modernizing these data tables, we have sought to be comprehensive in our coverage of the known materials, but selective in the properties to include. In guiding the latter selection, we aim to feature only those properties that are of genuine stand-alone use as figures of merit or in a comparative sense. Because no mere table of data can hope to adequately convey the nuances of materials as complex in structure and properties as the high-temperature superconductors, we avoid qualifications and list in each case the best value to which we have access. This matter of judgment must be supplemented by the reader referring in each case to a primary source to validate the entry. Lattice parameters have been rounded to four decimal places as a compromise between accuracy and generality. Critical temperatures are given to two significant figures for the same reason. The data given in Table 1 are ranges or averages of the most reliable values found in the literature.

These tables are current through 2020 and constitute a complete revision and update of previous data. The data listed here are compiled from a large number of sources spanning the primary literature. Individual references for each datum are too numerous to list. Secondary sources, as listed under the references, have been used to ensure the accuracy and completeness of the work.

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TABLE 1. Detailed Superconducting Properties of Selected High-Temperature Superconductors

		Coherence lengths		Penetration depths		Critical fields			
Mol. form.	T_c^{max}/K	ξ_{ab}/nm	ξ_c/nm	λ_{ab}/nm	λ_c/μm	B_{c1}^{ab}/mT	B_{c1}^{c}/mT	B_{c2}^{ab}/T	B_{c2}^{c}/T
$La_{1.85}Sr_{0.15}CuO_4$	39	2.2±0.1	0.06-0.3	219±10	<5	7	30	84±6	70±10
$Nd_{1.85}Ce_{0.15}CuO_{4-\delta}$	30	7.0±1.0	0.23	76±5				>100	7±1
$YBa_2Cu_3O_{7-\delta}$	93	1.5	0.14-0.3	90±10	0.64	3–5	30–50	240±25	150±30
$YBa_2Cu_4O_8$	81	1.9	0.2–1.1	130–200	0.16	34	17–32		90
$(Cu_{0.5}C_{0.5})Ba_2Ca_3Cu_4O_{11+\delta}$	117	1.6	1.0	120	0.22	26	63	195	121
$HgBa_2CuO_{4+\delta}$	97	2.1	1.2	120-200	0.45	8.2	12.9	125	70-100
$HgBa_2CaCu_2O_{6+\delta}$	127	1.5±0.1	0.4	190	0.83	21	50		110-170
$HgBa_2Ca_2Cu_3O_{8+\delta}$	135	1.3±0.1		180±30	3.5	5-10	35±10	350±50	100-200

Mol. form.	T_c^{max}/K	Coherence lengths ξ_{ab}/nm	ξ_c/nm	Penetration depths λ_{ab}/nm	λ_c/µm	Critical fields B_{c1}^{ab}/mT	B_{c1}^{c}/mT	B_{c2}^{ab}/T	B_{c2}^{c}/T
$Tl_2Ba_2CuO_{6+\delta}$	92	5	0.2	170±10	2.0		6	300	65
$Tl_2Ba_2CaCu_2O_{8+\delta}$	119	3	0.7	180±40	>25	60	28	>120	>100
$Tl_2Ba_2Ca_2Cu_3O_{10+\delta}$	128	1-3	<0.09	196±10	>20			200	>75
$Bi_2Sr_2CaCu_2O_{8+\delta}$	96	0.8-0.9	≤0.05	150±20	10-40	0.25-0.5	6-10	>250	220±30
$Bi_2Sr_2Ca_2Cu_3O_{10+\delta}$	110	0.6-0.9	0.02-0.09	120±10	1.0	0.94	54	>250	184
$Fe_{1+\delta}Se$	8.5	4.7	2.8	400			2.5	25	15
$FeSe_{0.5}Te_{0.5}$	15	2.8	3.0	460±100	1.1±0.3	2.2	4.5	42	45
(Li,Fe)OHFeSe	42	2.7	0.24	200	1.8		4.5	98	67
LiFeAs	18	4.4±0.4	1.8±0.2	200	0.25	16	19	30	24
$LaFeAsO_{1-x}F_x$	26	2.8	1.0±0.1	310			6	63	42
$NdFeAsO_{1-x}F_x$	47	2.2±0.2	0.4±0.1	200		18	25	130	70
$Ba_{0.6}K_{0.4}Fe_2As_2$	38	1.6	0.75	200				90	75
$Ba(Fe_{0.92}Co_{0.08})_2As_2$	22	2.45	1.4±0.1	200			20	65	55
$BaFe_2(As_{0.7}P_{0.3})_2$	31	2.3	1.3±0.2	300			63	90	60
$CaKFe_4As_4$	35	1.83±0.03	1.87±0.06	100		120	25	95	102
MgB_2	39	10±1	2.0±0.2	85±6	0.09±0.01	35±5		17±2	3.0±0.5

TABLE 2. Crystal Structures and Critical Temperatures of the Infinite Layer and "214" High-Temperature Superconductors

Mol. form.	Structure (lattice parameters in nm)	T_c^{max}/K	Comments
0011, i.e., infinite layer structures	**P4/mmm ($BaCuO_2$ structure)**		
$Sr_{1-x}CuO_2$	a = 0.3927, c = 0.3435	60	
$Sr_{1-x}Ca_xCuO_2$	a = 0.3902, c = 0.3350	110	x_{max} = 0.3
$Sr_{1-x}Ba_xCuO_2$	a = 0.3922, c = 0.343	90	x_{max} = 0.1
$Sr_{1-x}La_xCuO_2$	a = 0.3951, c = 0.3409	42	x_{max} = 0.1
$Sr_{1-x}Pr_xCuO_2$	a = 0.3942, c = 0.3391	43	x_{max} = 0.12
$Sr_{1-x}Nd_xCuO_2$	a = 0.3935, c = 0.3413	45	x_{max} = 0.12
$Sr_{1-x}Sm_xCuO_2$	a = 0.3942, c = 0.3391	42	x_{max} = 0.1
0201, i.e., "214" T structures	**I4/mmm (K_2NiF_4 structure)**		
$La_2CuO_{4+\delta}$	a = 0.379, c = 1.319	0	
$La_2CuO_{4+\delta}$	Bmab; a = 0.5345, b = 0.5433, c = 1.3252	42	
$La_2CuO_4F_x$	Phase uncertain	35	
$(Ca_{1-x}Na_x)_2CuO_2Cl_2$	a = 0.3855, c = 1.510	26	x_{max} = 0.04
$(La_{1-x}Na_x)_2CuO_4$	a = 0.3775, c = 1.3170	30	x_{max} = 0.3-0.5
$(La_{1-x}K_x)_2CuO_4$	a = 3.7683, c = 1.3259	41	
$(La_{1-x}Rb_x)_2CuO_4$	a = 0.3878, c = 1.3276	22	
$(La_{1-x}Ca_x)_2CuO_4$	Cmca; a = 0.5341, b = 0.5359, c = 1.3170	24	x_{max} = 0.05
$(La_{1-x}Sr_x)_2CuO_4$	a = 0.3779, c = 1.3226	39	x_{max} = 0.075
$(La_{1-x}Ba_x)_2CuO_4$	a = 0.3779, c = 1.323	28	
0021, i.e., "214" T' structures	**I4/mmm (Nd_2CuO_4 structure)**		
$(La_{1-x}RE_x)_2CuO_{4+\delta}$		up to 21	Thin films; RE = Y, Lu, Sm, Eu, Gd, Tb
$(La_{1-x}Ce_x)_2CuO_{4-\delta}$	a = 0.4007, c = 1.244	30	Electron-doped, x_{max} = 0.065
$(Pr_{1-x}Ce_x)_2CuO_{4-\delta}$		17	Electron-doped
$Pr_{1-x}Ce_{0.15}Sr_xCuO_{3.94}$	a = 0.396, c = 1.216	21	Electron-doped, x_{max} = 0.06
$(Nd_{1-x}Ce_x)_2CuO_{4-\delta}$	a = 0.3947, c = 1.2078	30	Electron-doped, x_{max} = 0.075
$Nd_2CuO_{4-\delta}F_y$	a = 0.3951, c = 1.2115	25	Electron-doped, x_{max} = 0.2
$(Sm_{1-x}Ce_x)_2CuO_{4-\delta}$		15	Electron-doped
$(Eu_{1-x}Ce_x)_2CuO_{4-\delta}$		13	Electron-doped, x_{max} = 0.075-0.085
0222, i.e., "214" T* structures	**P4/nmm (alternating T and T')**		
$La_{1-x/2}Eu_{1-x/2}Sr_xCuO_4$	a = 0.3871, c = 1.2597	25	x_{max} = 0.14
$(Nd,Sr,Ce)_2CuO_4$	a = 0.3856, c = 1.2484	25	
$SmLa_{1-x}Sr_xCuO_{4-\delta}$		33	x_{max} = 0.15

TABLE 3. Crystal Structures and Critical Temperatures of the $RE_2Ba_4Cu_{5+n}O_{13+n}$ Series of High-Temperature Superconductors

Mol. form.	Structure (lattice parameters in nm)	T_c^{max}/K	Comments
123 (*n* = 1)	**Pmmm**		
$YBa_2Cu_3O_{7-\delta}$	*a* = 0.3820, *b* = 0.3885, *c* = 1.1676	93	
$YSr_2Cu_3O_{7-\delta}$	P4/mmm, *a* = 0. 3786, *c* = 1.1386	63	
$YCa_2Cu_3O_{7-\delta}$	*a* = 0.3643, *b* = 0.3838, *c* = 1.1759	84	
$La_{1+x}Ba_{2-x}Cu_3O_{7-\delta}$	*a* = 0.3885, *b* = 0.3938, *c* = 1.1817	93	$x > 0.25$ for phase stability
$CeBa_2Cu_3O_{7-\delta}$	Forms $BaCeO_3$ due to tetravalent Ce	—	
$Pr_{1+x}Ba_{2-x}Cu_3O_{7-\delta}$	*a* = 0.3866, *b* = 0.3933, *c* = 1.1724	0	$x > 0.15$ for phase stability
$Nd_{1+x}Ba_{2-x}Cu_3O_{7-\delta}$	*a* = 0.3878, *b* = 0.3913, *c* = 1.1753	94	$x > 0.1$ for phase stability
$PmBa_2Cu_3O_{7-\delta}$	Not synthesized due to radioactive Pm	—	
$SmBa_2Cu_3O_{7-\delta}$	*a* = 0.3902, *b* = 0.3844, *c* = 1.1725	95	
$EuBa_2Cu_3O_{7-\delta}$	*a* = 0.3897, *b* = 0.3838, *c* = 1.1707	95	
$GdBa_2Cu_3O_{7-\delta}$	*a* = 0.3895, *b* = 0.3835, *c* = 1.1699	95	
$TbBa_2Cu_3O_{7-\delta}$	Forms $BaTbO_3$ by Ba-Tb intermixing	—	
$TbSr_2Cu_{2.7}Mo_{0.3}O_{7-\delta}$	P4/mmm, *a* = 0.3871, *c* = 1.15784	80	Mo necessary for phase stability
$DyBa_2Cu_3O_{7-\delta}$	*a* = 0.3887, *b* = 0.3825, *c* = 1.1686	93	
$HoBa_2Cu_3O_{7-\delta}$	*a* = 0.3885, *b* = 0.3819, *c* = 1.1677	93	
$ErBa_2Cu_3O_{7-\delta}$	*a* = 0.3878, *b* = 0.3813, *c* = 1.1664	93	
$TmBa_2Cu_3O_{7-\delta}$	*a* = 0.3875, *b* = 0.3809, *c* = 1.1666	90	
$YbBa_2Cu_3O_{7-\delta}$	*a* = 0.3871, *b* = 0.3802, *c* = 1.1658	90	Multiphase due to small Yb ion
$LuBa_2Cu_3O_{7-\delta}$	*a* = 0.387, *b* = 0.380, *c* = 1.169	93	Mostly multiphase due to small Lu ion
247 (*n* = 2)	**Ammm**		
$Y_2Ba_4Cu_7O_{15-\delta}$	*a* = 0.3854, *b* = 0.3874, *c* = 5.040	55	
$Pr_2Ba_4Cu_7O_{15-\delta}$	*a* = 0.3892, *b* = 0.3902, *c* = 5.081	10	
$N_d2Ba_4Cu_7O_{15-\delta}$	*a* = 0.3894, *b* = 0.3901, *c* = 5.079	40	
$Eu_2Ba_4Cu_7O_{15-\delta}$	*a* = 0.3879, *b* = 0.3886, *c* = 5.039	45	
$Gd_2Ba_4Cu_7O_{15-\delta}$	*a* = 0.3872, *b* = 0.3879, *c* = 5.036	45	
$Dy_2Ba_4Cu_7O_{15-\delta}$	*a* = 0.3864, *b* = 0.3879, *c* = 5.039	50	
$Ho_2Ba_4Cu_7O_{15-\delta}$	*a* = 0.3857, *b* = 0.3879, *c* = 5.040	55	
$Er_2Ba_4Cu_7O_{15-\delta}$	*a* = 0.3847, *b* = 0.3873, *c* = 5.044	55	
$Yb_2Ba_4Cu_7O_{15-\delta}$	*a* = 0.381, *b* = 0.386, *c* = 5.045	86	
124 (*n* = 3)	**Ammm**		
$YBa_2Cu_4O_8$	*a* = 0.3840, *b* = 0.3870, *c* = 2.7231	81	
$LaBa_2Cu_4O_8$	*a* = 0.3854, *b* = 0.3874, *c* = 2.710	?	Superconductivity not reported
$CeBa_2Cu_4O_8$	No reports on phase formation	—	
$PrBa_2Cu_4O_8$	*a* = 0.3884, *b* = 0.3903, *c* = 2.7293	0	
$NdBa_2Cu_4O_8$	Small volume fraction, multiphase	~57	
$PmBa_2Cu_4O_8$	Not synthesized due to radioactive Pm	?	
$SmBa_2Cu_4O_8$	*a* = 0.3872, *b* = 0.3886, *c* = 2.7308	69	
$EuBa_2Cu_4O_8$	*a* = 0.3865, *b* = 0.3884, *c* = 2.7279	78	
$GdBa_2Cu_4O_8$	*a* = 0.3863, *b* = 0.3881, *c* = 2.7259	74	
$TbBa_2Cu_4O_8$	Single synthesis attempt	?	Superconductivity not reported
$DyBa_2Cu_4O_8$	*a* = 0.3846, *b* = 0.3873, *c* = 2.7237	77	
$HoBa_2Cu_4O_8$	*a* = 0.3840, *b* = 0.3870, *c* = 2.7221	80	
$ErBa_2Cu_4O_8$	*a* = 0.3837, *b* = 0.3869, *c* = 2.7230	78	
$TmBa_2Cu_4O_8$	*a* = 0.3827, *b* = 0.3864, *c* = 2.718	79	
$YbBa_2Cu_4O_8$	*a* = 0.3846, *b* = 0.3871, *c* = 2.7231	80	
$Yb(Ba_{0.8}Sr_{0.2})_2Cu_4O_8$	*a* = 0.3805, *b* = 0.3855, *c* = 2.7072	83	Sr improves phase stability
$(Yb_{0.95}Ca_{0.05})Ba_2Cu_4O_8$	*a* = 0.3822, *b* = 0.3853, *c* = 2.7175	85	Ca improves phase stability
$LuBa_2Cu_4O_8$	*a* = 0.3844, *b* = 0.3871, *c* = 2.7225	82	

TABLE 4. Crystal Structures and Critical Temperatures of the $RE_nBa_mCu_{n+m}O_{2(n+m+1)}$ Series of High-Temperature Superconductors

Mol. form.	Structure (lattice parameters in nm)	T_c^{max}/K	Comments
***n* = 2**	**Pmm2**		
$YBa_2Cu_3O_{7-\delta}$	a = 0.3820, b = 0.3885, c = 1.1676	93	cf. Table 3 (123 compounds)
	Pmmm		
$YBa_3Cu_4O_{9-\delta}$	a = 0.3802, b = 0.3885, c = 1.5256	88	
$YBa_4Cu_5O_{11-\delta}$	a = 0.3802, b = 0.3865, c = 1.9382	91	
$YBa_5Cu_6O_{13-\delta}$	a = 0.3801, b = 0.3891, c = 2.2944	85	
***n* = 3**	**Pmm2**		
$Y_3Ba_5Cu_8O_{18}$	a = 0.3888, b = 0.3823, c = 3.1013	102	
$Nd_3Ba_5Cu_8O_{18}$	a = 0.3922, b = 0.3862, c = 3.5211	95	
$Sm_3Ba_5Cu_8O_{18}$	a = 0.3899, b = 0.3852, c = 3.5146	97	
$Eu_3Ba_5Cu_8O_{18}$	a = 0.3864, b = 0.3888, c = 3.113	66	
$Gd_3Ba_5Cu_8O_{18}$	a = 0.3851, b = 0.3877, c = 3.112	97	
$Dy_3Ba_5Cu_8O_{18}$	a = 0.3833, b = 0.3867, c = 3.1025	81	
$Ho_3Ba_5Cu_8O_{18}$	a = 0.3832, b = 0.3875, c = 3.101	84	
$(Yb_{0.6}Sm_{0.4})_3Ba_5Cu_8O_{18}$	a = 0.3891, b = 0.3829, c = 3.1209	88	Sm required for phase stability
$Y_3Ba_8Cu_{11}O_{24}$	a = 0.3814, b = 0.3885, c = 4.2699	91	
***n* = 4**	**Pmm2**		
$Y_2Ba_3Cu_5O_{11-\delta}$	a = 0.3820, b = 0.3868, c = 1.8930	92	
$Gd_2Ba_3Cu_5O_{11-\delta}$	a = 0.3882, b = 0.3874, c = 1.9355	16	
$Y_2Ba_5Cu_7O_{15-\delta}$	a = 0.3832, b = 0.3851, c = 2.8683	98	
$Y_2Ba_5Cu_8O_{17-\delta}$	a = 0.3871, b = 0.3848, c = 2.7160	105	Extra CuO_2 layer
$Y_2Ba_5Cu_9O_{19-\delta}$	a = 0.3821, b = 0.3898, c = 2.3320	94	Extra CuO_2 layers
***n* > 4**	**Pmm2**		
$Gd_5Ba_7Cu_{12}O_{26-\delta}$	a = 0.3868, b = 0.3876, c = 4.6507	22	
$Y_5Ba_8Cu_{13}O_{28-\delta}$	a = 0.3819, b = 0.3897, c = 5.0461	91	
$Y_7Ba_{11}Cu_{18}O_{38-\delta}$	a = 0.3824, b = 0.3880, c = 6.9870	91	
$Y_{13}Ba_{20}Cu_{33}O_{68-\delta}$	a = 0.3815, b = 0.3878, c = 12.8116	89	

TABLE 5. Crystal Structures and Critical Temperatures of the $M_mAE_2Ca_{n-1}Cu_nO_{2+m+2n}$ (*M* = B, Cu, Au, Hg, Tl, Pb, Bi; *AE* = Ca, Sr, Ba, La) Series of High-Temperature Superconductors

Mol. form.	Structure (lattice parameters in nm)	T_c^{max}/K	Comments
02(*n*-1)*n* (*m* = 0)	**I4/mmm**		
Ba_2CuO_4	a = 0.385, c = 1.46	85	Thin film; cf. Table 2 (T structures)
$Ba_2CaCu_2O_6$	a = 0.385, c = 2.20	103	
$Ba_2Ca_2Cu_3O_8$	a = 0.385, c = 2.83	126	
$Ba_2Ca_3Cu_4O_{10}$	a = 0.385, c = 4.04	117	
$Ba_2CaCu_2O_4(O_{1-x}F_x)_2$	a = 0.3879, c = 1.471	90	
$Ba_2Ca_2Cu_3O_6(O_{1-x}F_x)_2$	a = 0.3861, c = 2.108	120	
$Ba_2Ca_3Cu_4O_8(O_{1-x}F_x)_2$	a = 0.3856, c = 2.745	105	
$Ba_2Ca_4Cu_5O_{10}(O_{1-x}F_x)_2$	a = 0.3860, c = 3.382	90	
$Sr_2CuO_{3+\delta}$	a = 0.3764, c = 1.2548	70	
$Sr_2CuO_{4-\delta}$	a = 0.3795, c = 1.2507	95	cf. Table 2 (T structures)
$Sr_2CuO_2F_{2+\delta}$	Fmmm; a = 0.5394, b = 0.5513, c = 1.3468	46	
$Sr_2CaCu_2O_6$	a = 0.386, c = 2.04	70	
$Sr_3Cu_2O_{5+\delta}$ (i.e. $Sr_2SrCu_2O_{5+\delta}$)	a = 0.3902, c = 2.1085	100	
$(Sr,Ca)_2CaCu_2O_4Cl_2$	a = 0.387, c = 2.216	80	
$Sr_2Ca_2Cu_3O_8$	a = 0.386, c =2.72	90	
$Sr_2Ca_3Cu_4O_{10}$	a = 0.386, c = 3.40	70	
$(La_{1-x}Ca_x)_2CaCu_2O_{6+\delta}$	a = 0.3821, c = 1.953	60	x_{max} = 0.075
$(La_{1-x}Sr_x)_2CaCu_2O_{6-\delta}$	a = 0.3821, c = 1.9599	60	x_{max} = 0.2
$(La_{1-x}Sr_x)_2CaCu_2O_4Cl_2$	a = 0.3827, c = 1.942	45	x_{max} = 0.2

Mol. form.	Structure (lattice parameters in nm)	T_c^{max}/K	Comments
12(*n*-1)*n* (*m* = 1)	**P4/mmm**		
$BSr_2Ca_2Cu_3O_9$	*a* = 0.3821, *c* = 1.3854	75	
$BSr_2Ca_3Cu_4O_{11}$	*a* = 0.3836, *c* = 1.7082	110	
$BSr_2Ca_4Cu_5O_{13}$	*a* = 0.3837, *c* = 2.022	85	
$CuBa_2Ca_2Cu_3O_9$	Not synthesized in pure form	–	
$(Cu_{0.5}C_{0.5})Ba_2Ca_2Cu_3O_9$	*a* = 0.3859, *c* = 1.4766	118	
$CuBa_2Ca_3Cu_4O_{11+\delta}$	Not synthesized in pure form	–	
$(Cu_{0.5}C_{0.5})Ba_2Ca_3Cu_4O_{11+\delta}$	*a* = 0.3855, *c* = 1.7930	117	
$Au(Ba,La)CuO_{5+\delta}$	Pmmm; *a* = 0.3798, *b* = 0.3851, *c* = 0.8575	19	
$AuBa_2(Y_{1-x}Ca_x)Cu_2O_7$	Pmmm; *a* = 0.3826, *b* = 0.3850, *c* = 1.2075	84	x_{max} = 0.4
$AuBa_2Ca_2Cu_3O_9$	Pmmm; *a* = 0.3812, *b* = 0.3856, *c* = 1.5443	30	
$AuBa_2Ca_3Cu_4O_{11}$	Pmmm; *a* = 0.3827, *b* = 0.3851, *c* = 1.8494	99	
$HgSr_2CuO_{4+\delta}$	Not synthesized in pure form	–	
$(Hg_{1-x}Mo_x)Sr_2CuO_x$	*a* = 0.3787, *c* = 0.8844	78	x_{max} = 0.15
$(Hg_{0.9}Re_{0.1})Sr_2CuO_x$	*a* = 0.378, *c* = 0.884	66	x_{max} = 0.15
$HgBa_2CuO_{4+\delta}$	*a* = 0.3883, *c* = 0.9513	97	
$HgBa_2CaCu_2O_{6+\delta}$	*a* = 0.3853, *c* = 1.2637	127	
$HgBa_2Ca_2Cu_3O_{8+\delta}$	*a* = 0.3850, *c* = 1.5784	135	
$HgBa_2Ca_3Cu_4O_{10+\delta}$	*a* = 0.3854, *c* = 1.9006	127	
$HgBa_2Ca_4Cu_5O_{12+\delta}$	*a* = 0.3851, *c* = 2.2136	110	
$HgBa_2Ca_5Cu_6O_{14+\delta}$	*a* = 0.3851, *c* = 2.5251	107	
$HgBa_2Ca_6Cu_7O_{16+\delta}$	*a* = 0.3851, *c* = 2.8406	89	
$HgBa_2Ca_7Cu_8O_{18+\delta}$	*a* = 0.3847, *c* = 3.1583	<90	
$TlSr_2CuO_{5-\delta}$	Pmmm; *a* = 0.3661, *b* = 0.3793, *c* = 0.899	0	
$(Tl_{0.5}Pb_{0.5})Sr_2CuO_{5\pm\delta}$	*a* = 0.3736, *c* = 0.9022	60	
$Tl(Sr,Ba)_2CuO_{5-\delta}$	*a* = 0.3805, *c* = 0.9120	43	
$Tl(Sr,La)_2CuO_5$	*a* = 0.37, *c* = 0.9	40	
$TlSr_2CaCu_2O_7$	*a* = 0.3797, *c* = 1.2092	55	
$(Tl_{0.5}Pb_{0.5})Sr_2CaCu_2O_7$	*a* = 0.3802, *c* = 1.2107	85	
$TlSr_2(Ca_{0.5}Y_{0.5})Cu_2O_7$	*a* = 0.380, *c* = 1.210	90	
$(Tl_{0.5}Pb_{0.5})Sr_2(Ca_{0.8}Y_{0.2})Cu_2O_7$	*a* = 0.3808, *c* = 1.2014	107	
$TlBa_2CuO_{5-\delta}$	*a* = 0.3859, *c* = 0.9261	9.5	
$Tl(Ba_{0.6}La_{0.4})_2CuO_5$	*a* = 0.3848, *c* = 0.9091	52	
$TlBa_2CaCu_2O_7$	*a* = 0.3857, *c* = 1.2754	103	
$TlBa_2Ca_{1-x}Y_xCu_2O_7$	*a* = 0.3850, *c* = 1.265	86	x_{max} = 0.25
$TlBa_2Ca_2Cu_3O_9$	*a* = 0.385, *c* = 1.59	130	
$TlBa_2Ca_3Cu_4O_{11}$	*a* = 0.385, *c* = 1.91	122	
$TlBa_2Ca_4Cu_5O_{13}$	*a* = 0.385, *c* = 2.23	117	
$PbSr_2CuO_{5-\delta}$	Tetragonal; *a* = 0.381, *c* = 0.881	40	Thin film
$PbSr_2CaCu_2O_7$	Orthorhombic; *a* = 0.381, *b* = 0.383, *c* = 1.21	70	
$PbSr_2Ca_2Cu_3O_9$	Pseudotetragonal; *a* = 0.3834, *c* = 1.529	122	
$PbSr_2Ca_3Cu_4O_{11}$	Not synthesized in pure form	–	
$(Pb_{0.6}Sr_{0.3}Cu_{0.1})Sr_2(Ca,Sr)_3Cu_4O_{11}$	*a* = 0.3833, *c* = 1.8442	107	
22(*n*-1)*n* (*m* = 2)	**I4/mmm**		
$Cu_2Ba_2Ca_2Cu_3O_{11}$	Not synthesized in pure form	–	
$(Cu_{0.5}C_{0.5})_2Ba_3Ca_3Cu_4O_{13}$	P4/mmm; *a* = 0.3855, *c* = 2.187	113	Extra BaO layer
$(Cu_{0.5}C_{0.5})_2Ba_3Ca_4Cu_5O_{15}$	P4/mmm; *a* = 0.3857, *c* = 2.5067	~110	Extra BaO layer
$Hg_2Ba_2CaCu_2O_8$	Unstable	—	
$Hg_2Ba_2(Y_{0.6}Ca_{0.4})Cu_2O_{8-\delta}$	*a* = 0.3855, *c* = 2.894	45	
$(Hg_{0.7}Tl_{0.3})_2Ba_2(Y_{1-x}Ca_x)Cu_2O_{8-\delta}$	*a* = 0.386, *c* = 2.90	84	x_{max} = 0.4; T_c = 12 K for *x* = 0
$(Hg_{0.6}Tl_{0.4})_2Ba_2Ca_2Cu_3O_{10}$	*a* = 0.3840, *c* = 3.569	45	
$(Hg_{0.6}Tl_{0.4})_2Ba_2Ca_3Cu_4O_{12}$	*a* = 0.3845, *c* = 4.206	114	
$Tl_2Ba_2CuO_{6+\delta}$	*a* = 0.3866, *c* = 2.3239	92	
$Tl_2Ba_2CaCu_2O_{8+\delta}$	*a* = 0.3855, *c* = 2.9318	119	
$Tl_2Ba_2Ca_2Cu_3O_{10+\delta}$	*a* = 0.3850, *c* = 3.588	128	
$Tl_2Ba_2Ca_3Cu_4O_{12+\delta}$	*a* = 0.3581, *c* = 4.199	119	

Mol. form.	Structure (lattice parameters in nm)	T_c^{max}/K	Comments
$Pb_2(Sr,La)_2Cu_2O_6$	$P222_1$; $a = 0.5333$, $b = 0.5421$, $c = 1.2609$	32	
$Pb_2Sr_2(Y_{1-x}Ca_x)Cu_3O_8$	Cmmm; $a = 0.5393$, $b = 0.5431$, $c = 1.5733$	80	
$Pb_2Sr_2La_{0.5}Ca_{0.5}Cu_3O_8$	Cmmm; $a = 0.5435$, $b = 0.5463$, $c = 1.5817$	70	
$Bi_2Sr_2CuO_{6+\delta}$	Cmmm; $a = 0.5361$, $b = 0.5370$, $c = 2.4369$	9	
$Bi_2(Sr_{1-x}La_x)_2CuO_{6+\delta}$	Cmmm; $a = 0.5417$, $b = 0.5381$, $c = 2.439$	33	$x_{max} \approx 0.2$
$Bi_{1.6}Pb_{0.4}Sr_{1.6}La_{0.4}CuO_{6+\delta}$		39	
$Bi_2Sr_2CaCu_2O_{8+\delta}$	Fmmm; $a = 0.5413$, $b = 0.5411$, $c = 3.091$	96	
$Bi_2Sr_2Ca_2Cu_3O_{10+\delta}$	Fmmm; $a = 0.539$, $b = 0.539$, $c = 3.71$	110	
$(Bi_{0.8}Pb_{0.2})_2Sr_2Ca_2Cu_3O_{10+\delta}$	Fmmm; $a = 0.5413$, $b = 0.5413$, $c = 3.710$	110	Pb stabilizes phase formation
$Bi_2Sr_2Ca_3Cu_4O_{12+\delta}$		47	Thin film
$Bi_2Sr_2(Ln_{1-x}Ce_x)_2Cu_2O_{10+y}$	Cmma; $a = 0.55$, $b = 0.55$, $c = 1.79$	~25	Ln = Sm, Eu, Gd; $x_{max} = 0.15$

TABLE 6. Crystal Structures and Critical Temperatures of the $M_mAE_2RE_sCu_2O_{4+m+2s}$ (M = Fe, Co, Cu, Ga, Nb, Ru, Tl, Pb, Bi, AE = Sr, Ba, RE = Rare-Earth or Ca, Sr) Series of High-Temperature Superconductors

Mol. form.	Structure (lattice parameters in nm)	T_c^{max}/K	Comments
12s2			
$FeSr_2YCu_2O_{6+\delta}$	Ortho; $a = 0.5409$, $b = 0.5458$, $c = 2.292$	60	
$FeSr_2NdCu_2O_{6+\delta}$	P4/mmm; $a = 0.3843$, $c = 1.1458$	50	
$CoSr_2(Y_{1-x}Ca_x)Cu_2O_{7-\delta}$	Ima2; $a = 0.540$, $b = 0.541$, $c = 2.253$	40	
$CuSr_2YCu_2O_{7-\delta}$	P4/mmm, $a = 0.3786$, $c = 1.1386$	63	$YSr_2Cu_3O_{7-\delta}$, cf. Table 3 (123 compounds)
$(Cu_{1-x}Au_x)Sr_2YCu_2O_{7-\delta}$	P4/mmm; $a = 0.394$, $c = 1.201$	80	
$(Cu_{0.75}Mo_{0.25})Sr_2YCu_2O_{7+\delta}$	P4/mmm; $a = 0.3815$, $c = 1.15$	88	
$(Cu_{0.75}Mo_{0.25})Sr_2(Ce_{0.50}Y_{0.50})_2Cu_2O_{9+\delta}$	I4/mmm; $a = 0.3825$, $c = 1.40$	58	
$(Cu_{0.75}Mo_{0.25})Sr_2(Ce_{0.67}Y_{0.33})_3Cu_2O_{11+\delta}$	P4/mmm; $a = 0.3829$, $c = 1.68$	55	
$(Cu_{0.75}Mo_{0.25})Sr_2(Ce_{0.75}Y_{0.25})_4Cu_2O_{13+\delta}$	I4/mmm; $a = 0.3828$, $c = 1.98$	55	
$Cu(Ba,Eu)_2(Ce,Eu)_2Cu_2O_9$	I4/mmm; $a = 0.386$, $c = 2.848$	62	
$GaSr_2(Y_{1-x}Ca_x)Cu_2O_{7-\delta}$	Ima2; $a = 0.539$, $b = 0.548$, $c = 2.275$	70	
$(Ga_{1-y}Cu_y)Sr_2(Y_{1-x}Ca_x)Cu_2O_7$	Pmmm; $a = 0.539$, $b = 0.548$, $c = 2.281$	50	
$(Nb_{1-x}Cd_x)Sr_2EuCu_2O_{8-\delta}$	P4/mmm, $a = 0.3874$, $c = 1.1629$	43	$x_{max} = 0.2$
$RuSr_2YCu_2O_{8-\delta}$	P4/mbm; $a = 0.3820$, $c = 1.1518$	39	Ferromagnetic superconductor
$RuSr_2SmCu_2O_{8-\delta}$	P4/mbm; $a = 0.3852$, $c = 1.156$	12	Ferromagnetic superconductor
$RuSr_2EuCu_2O_{8-\delta}$	P4/mbm; $a = 0.3843$, $c = 1.155$	36	Ferromagnetic superconductor
$RuSr_2GdCu_2O_{8-\delta}$	P4/mbm; $a = 0.3838$, $c = 1.153$	45	Ferromagnetic superconductor
$RuSr_2[(Eu,Gd)_{0.7}Ce_{0.3}]_2Cu_2O_{10-\delta}$	I4/mmm; $a = 0.3844$, $c = 2.8615$	35	Ferromagnetic superconductor
$TaSr_2(Gd_{1+x}Ce_{1-x})_2Cu_2O_9$	I4/mmm, $a = 0.3858$, $c = 2.881$	30	$x_{max} = 0.6$
$TlBa_2(Eu_{1-x}Ce_x)_2Cu_2O_9$	I4/mmm, $c = 3.05$	40	
$(Pb,Cu)(Sr,Eu)_2(Eu,Ce)_2Cu_2O_9$	I4/mmm; $a = 0.3837$, $c = 2.901$	25	
$(Bi_{0.4}Pb_{0.35}Cu_{0.05})Sr_2(Y_{0.5}Ca_{0.5})Cu_2O_{7+\delta}$	P4/mmm; $a = 0.3819$, $c = 1.181$	102	
22s2	**P4/nmm**		cf. Table 5 (2212 compounds)
$Bi_2Sr_2(Y_{1-x}Ce_x)_2Cu_2O_{10}$	$a = 0.3836$, $c = 1.785$	20	$x = 0.18$
$Bi_2Sr_2(Nd_{1-x}Ce_x)_2Cu_2O_{10}$	$a = 0.3881$, $c = 1.793$	14	$x = 0.18$
$Bi_2Sr_2(Sm_{1-x}Ce_x)_2Cu_2O_{10}$	$a = 0.3863$, $c = 1.790$	16	$x = 0.18$
$Bi_2Sr_2(Eu_{1-x}Ce_x)_2Cu_2O_{10}$	$a = 0.3854$, $c = 1.788$	27	$x = 0.18$
$Bi_2Sr_2(Gd_{1-x}Ce_x)_2Cu_2O_{10}$	$a = 0.3851$, $c = 1.788$	34	$x = 0.18$
$Bi_2Sr_2(Dy_{1-x}Ce_x)_2Cu_2O_{10}$	$a = 0.3844$, $c = 1.787$	27	$x = 0.18$
$Bi_2Sr_2(Ho_{1-x}Ce_x)_2Cu_2O_{10}$	$a = 0.3840$, $c = 1.786$	24	$x = 0.18$

TABLE 7. Crystal Structures and Critical Temperatures of the Chalcogenide Fe-Based Superconductors

Mol. form.	Structure (lattice parameters in nm)	T_c^{max}/K	Comments
11	**P4/nmm (PbO structure)**		
FeS	$a = 0.3680$, $c = 0.5031$	4.5	
$FeSe_{1-x}S_x$	$a = 0.377$, $c = 0.552$	11	
$Fe_{1+\delta}Se$	$a = 0.3762$, $c = 0.5502$	8.5	β-FeSe
$Fe_{1-x}Cr_xSe$	$a = 0.3773$, $c = 0.5524$	12	$x_{max} = 0.02$

Mol. form.	Structure (lattice parameters in nm)	T_c^{max}/K	Comments
$Fe_{1-x}Nb_xSe$		14	$x_{max} = 0.04$
$FeSe_{1-x}Te_x$	$a = 0.3798$, $c = 0.6038$	15	$x_{max} = 0.4$-0.6
FeTe	$a = 0.3825$, $c = 0.6291$	0	Antiferromagnetic
$FeTe_{1-x}S_x$	$a = 0.3812$, $c = 0.6244$	9.4	$x_{max} = 0.06$-0.12
122	**I4/mmm ($ThCr_2Si_2$ structure)**		
$Li_xFe_2Se_2$	$a = 0.3775$, $c = 1.704$	44	
$Na_xFe2Se_{2-\delta}$	$a = 0.3785$, $c = 1.7432$	46	
$K_xFe_2Se_2$	Multiphase	40	
$(Tl_{1-x}K_x)Fe_{2-y}Se_2$	$a = 0.388$, $c = 1.405$	31	$x = 0.25$-0.46, $y_{max} = 0.12$-0.22
$Rb_xFe_{2-y}Se_2$		33	
$Cs_xFe_{2-y}Se_2$	$a = 0.3850$, $c = 1.5647$	30	
$Ca_xFe_2Se_2$	Multiphase	~40	
$Sr_xFe_2Se_2$	Multiphase	38	
$Ba_xFe_2Se_{2-\delta}$	$a = 0.3778$, $c = 1.6843$	40	
$Eu_xFe_2Se_2$	Multiphase	40	
$Yb_xFe_2Se_2$	Multiphase	42	
Intercalated FeSe			
$(C_2H_8N_2)_xFeSe$	Amma; $a = 0.3865$, $b = 0.3897$, $c = 2.1700$	30	
$(C_4H_4N_2O_2S)_{0.3}FeSe$	$c = 1.55$	48	
$(C_{40}H_{54}O_{27})_{0.3}FeSe$	$c = 1.45$	45	
(Li,Fe)OHFeSe	P4/nmm; $a = 0.378$, $c = 0.930$	42	
$A_x(NH_3)_yFe_2Se_2$	I4/mmm	up to 44	A = **Li**, Na, **K**, Cs
$Li_x(NH_2)_y(NH_3)_{1-y}Fe_2Se_2$	I4/mmm; $a = 0.3825$, $c = 1.6527$	43	$x_{max} = 0.6$, $y_{max} = 0.2$
$Li_x[(CH_2)_n(NH_2)_2]_yFe_2Se_2$	I4/mmm	up to 41	n = 1,**2**,3
$Na_x[(CH_2)_n(NH_2)_2]_yFe_2Se_2$	I4/mmm	up to 47	n = 1,**2**,3
$Sr_x[(CH_2)_n(NH_2)_2]_yFe_2Se_2$	I4/mmm	up to 37	n = 1,**2**,3

TABLE 8. Crystal Structures and Critical Temperatures of the Pnictide Fe-Based Superconductors

Mol. form.	Structure (lattice parameters in nm)	T_c^{max}/K	Comments
111	**P4/nmm (anti-PbFCl structure)**		
LiFeP	$a = 0.3692$, $c = 0.6031$	~6	
LiFeAs	$a = 0.3772$, $c = 0.6357$	18	
$Na_{1-\delta}FeAs$	$a = 0.3949$, $c = 0.7040$	15	
$Na(Fe_{1-x}Co_x)As$	$c = 0.704$	20	$x_{max} = 0.3$
112	**P21/m**		
$CaFeAs_2$		0	
$(Ca_{1-x}RE_x)FeAs_2$		up to 43	RE = **La**, Pr, Nd, Sm, Eu, Gd
$(Ca_{1-x}RE_x)Fe(As_{1-y}Sb_y)_2$		up to 47	RE = **La**, Ce, Pr, Nd
$EuFeAs_2$		0	
$Eu(Fe_{1-x}Ni_x)As_2$	$a = 0.3987$, $b = 0.3908$, $c = 1.0645$	18	$x_{max} = 0.4$
$(Eu_{1-x}La_x)FeAs_2$	$a = 0.3980$, $b = 0.3900$, $c = 1.0643$	11	$x_{max} = 0.15$
1111	**P4/nmm (ZrCuSiAs structure)**		
LaOFeP	$a = 0.3964$, $c = 0.8512$	~4	
$LaOFeAs_{1-x}P_x$		11	$x_{max} = 0.25$ and 0.7
$La_{1-x}OFeP$	$a = 0.3961$, $c = 0.8506$	~7	$x_{max} = 0.1$
*Ln*OFeP		~4	*Ln* = Pr, Nd
$(Sr_{1-x}RE_x)FeAsF$		up to 56	RE = La, Nd, **Sm**
$Sr(Fe_{1-x}Co_x)AsF$	$a = 0.4002$, $c = 0.8943$	~4	$x_{max} = 0.125$
$(Ca_{1-x}RE_x)FeAsH$		up to 47	RE = **La**, Sm
$Ca(Fe_{1-x}Co_x)AsH$	$a = 0.382$, $c = 0.822$	24	$x_{max} = 0.15$
$Ca(Fe_{1-x}Co_x)AsF$	$a = 0.3880$, $c = 0.8552$	22	$x_{max} = 0.1$
$Ca(Fe_{1-x}Ni_x)AsF$	$a = 0.3879$, $c = 0.8578$	15	$x_{max} = 0.05$
$CaFeAs(F_{1-x}H_y)$	$a = 0.3896$, $c = 0.8669$	29	$x_{max} \approx 0.3$

Mol. form.	Structure (lattice parameters in nm)	T_c^{max}/K	Comments
$YFeAsO_{1-\delta}$	$a = 0.3842$, $c = 0.8303$	47	
$LaFeAsO_{1-\delta}$	$a = 0.4026$, $c = 0.8719$	28	
$CeFeAsO_{1-\delta}$	$a = 0.3995$, $c = 0.8631$	39	
$PrFeAsO_{1-\delta}$	$a = 0.3963$, $c = 0.8572$	48	
$NdFeAsO_{1-\delta}$	$a = 0.3943$, $c = 0.8529$	53	
$PmFeAsO_{1-\delta}$	Not synthesized due to radioactive Pm	–	
$SmFeAsO_{1-\delta}$	$a = 0.3922$, $c = 0.8452$	53	
$EuFeAsO_{1-\delta}$	Not reported	–	
$GdFeAsO_{1-\delta}$	$a = 0.3891$, $c = 0.8393$	54	
$TbFeAsO_{1-\delta}$	$a = 0.3878$, $c = 0.8353$	52	
$DyFeAsO_{1-\delta}$	$a = 0.3863$, $c = 0.8322$	51	
$HoFeAsO_{1-\delta}$	$a = 0.3846$, $c = 0.8295$	50	
$YFeAsO_{1-x}F_x$		10	$x_{max} = 0.1$
$LaFeAsO_{1-x}F_x$	$a = 0.4036$, $c = 0.8739$	26	
$CeFeAsO_{1-x}F_x$	$a = 0.3989$, $c = 0.8631$	41	$x_{max} = 0.16$
$PrFeAsO_{1-x}F_x$	$a = 0.3967$, $c = 0.8561$	47	$x_{max} = 0.15$
$NdFeAsO_{1-x}F_x$	$a = 0.3954$, $c = 0.8540$	47	$x_{max} = 0.15$
$PmFeAsO_{1-x}F_x$	Not synthesized due to radioactive Pm	–	
$SmFeAsO_{1-x}F_x$	$a = 0.3934$, $c = 0.8468$	58	$x_{max} = 0.2$
SmFeAsF	$a = 0.3940$, $c = 0.8503$	56	
$EuFeAsO_{1-x}F_x$		11	$x_{max} = 0.15$
$GdFeAsO_{1-x}F_x$	$a = 0.3915$, $c = 0.8457$	40	$x_{max} = 0.25$
$TbFeAsO_{1-x}F_x$	$a = 0.3860$, $c = 0.8332$	51	$x_{max} \approx 0.1$
$DyFeAsO_{1-x}F_x$	$a = 0.3843$, $c = 0.8284$	46	$x_{max} \approx 0.1$
$HoFeAsO_{1-x}F_x$	$a = 0.3830$, $c = 0.8270$	36	$x_{max} \approx 0.1$
$Gd_{1-x}Th_xFeAsO$	$a = 0.3916$, $c = 0.8439$	56	$x_{max} = 0.2$
$Tb_{1-x}Th_xFeAsO$	$a = 0.3903$, $c = 0.8413$	52	$x_{max} = 0.2$
$La(Fe_{1-x}Co_x)AsO$	$a = 0.4035$, $c = 0.8724$	13	$x_{max} = 0.06$
$Sm(Fe_{1-x}Co_x)AsO$	$a = 0.3939$, $c = 0.8467$	17	$x_{max} = 0.1$
$LaFeAsO_{1-x}H_x$	$a = 0.399$, $c = 0.865$	33	$x_{max} = 0.36$
$CeFeAsO_{1-x}H_x$	$a = 0.397$, $c = 0.861$	48	$x_{max} = 0.25$
$NdFeAsO_{1-x}H_x$		54	
$SmFeAsO_{1-x}H_x$	$a = 0.391$, $c = 0.845$	56	$x_{max} = 0.22$
$GdFeAsO_{1-x}H_x$	$a = 0.389$, $c = 0.840$	54	$x_{max} = 0.1$
$DyFeAsO_{1-x}H_x$		52	$x_{max} = 0.17$
$ErFeAsO_{1-x}H_x$	$a = 0.3822$, $c = 0.8281$	41	$x_{max} = 0.05$
ThFeAsN	$a = 0.4037$, $c = 0.8526$	30	Undoped superconductor
122	**I4/mmm ($ThCr_2Si_2$ structure)**		
$NaFe_2As_2$	Metastable $a = 0.3809$, $c = 1.2441$	25	
$(Ce_{0.5-x}Na_{0.5+x})Fe_2As_2$	$a = 0.3841$, $c = 1.2239$	26	$x_{max} = 0.3$
$(Pr_{0.5-x}Na_{0.5+x})Fe_2As_2$	$a = 0.3839$, $c = 1.2193$	25	$x_{max} = 0.25$
AFe_2As_2		up to 3.8	A = **K**, Rb, Cs
$(Ca_{1-x}Na_x)Fe_2As_2$	$a = 0.3841$, $c = 1.22$	33	$x_{max} = 0.66$
$(Ca_{1-x}RE_x)Fe_2As_2$		up to 49	RE = La, Ce, **Pr**
$Ca(Fe_{1-x}M_x)_2As_2$		up to 20	M = **Co**, Ni, Rh, Pd, Ir
$CaFe_2(As_{1-x}P_x)_2$	$a = 0.390$, $c = 1.165$	15	$x_{max} = 0.05$
$(Sr_{1-x}A_x)Fe_2As_2$		up to 37	A = Na, K, **Cs**
$(Sr_{1-x}La_x)Fe_2As_2$	$a = 0.395$, $c = 1.21$	22	$x_{max} = 0.3$. Thin film; metastable
$Sr(Fe_{1-x}M_x)_2As_2$		up to 24	M = Co, Ni, Ru, Rh, Pd, **Ir**, Pt
$SrFe_2(As_{1-x}P_x)_2$	$a = 0.390$, $c = 1.21$	33	$x_{max} = 0.35$
$(Ba_{1-x}A_x)Fe_2As_2$		up to 38	A = Na, **K**, Rb
$(Ba_{1-x}RE_x)Fe_2As_2$		up to 22	RE = **La**, Ce, Pr, Nd
$Ba(Fe_{1-x}M_x)_2As_2$		up to 24	M = Co, Ni, Ru, Rh, Pd, **Ir**, Pt
$BaFe_2(As_{1-x}P_x)_2$		31	$x_{max} = 0.32$
$Ba_2Ti_2Fe_2As_4O$	$a = 0.4028$, $c = 2.7344$	21	Intergrowth of $BaFe_2As_2$ and $BaTi_2As_2O$
$LaFe_2As_2$	$a = 0.3938$, $c = 1.1714$	12	
$(La_{0.5-x}Na_x)Fe_2As_2$	$a = 0.3841$, $c = 1.2325$	27	$x_{max} = 0.3$
$(La_{0.5-x}Na_xK_{0.5})Fe_2As_2$	$a = 0.3850$, $c = 1.321$	23	$x_{max} = 0.25$

Mol. form.	Structure (lattice parameters in nm)	T_c^{max}/K	Comments
$(Eu_{1-x}A_x)Fe_2As_2$		up to 35	A = Na, **K**, x_{max} = 0.5, antiferromagnetic
$(Eu_{0.78}La_{0.27})Fe_2As_2$		13	Antiferromagnetic
$Eu(Fe_{1-x}M_x)_2As_2$			M = Co, **Ir**, Ru, Rh, antiferromagnetic
$EuFe_2(As_{1-x}P_x)_2$	a = 0.389, c = 1.1835	30	x_{max} = 0.3, antiferromagnetic
1144 (2×122)	**P4/mmm**		
$(La,Na)RbFe_4As_4$	a = 0.3861, c = 1.326	26	
$(La,Na)CsFe_4As_4$	a = 0.3880, c = 1.360	24	
$CaKFe_4As_4$	a = 0.3866, c = 1.2817	35	
$CaRbFe_4As_4$	a = 0.3876, c = 1.3104	35	
$CaCsFe_4As_4$	a = 0.3891, c = 1.3414	32	
$SrRbFe_4As_4$	a = 0.3897, c = 1.3417	35	
$SrCsFe_4As_4$	a = 0.3910, c = 1.3729	37	
$BaCsFe_4As_4$	Possibly 122 structure	26	
$EuRbFe_4As_4$	a = 0.3889, c = 1.330	36	
$EuCsFe_4As_4$	a = 0.3901, c = 1.361	35	
12442 (122+2×1111)	**I4/mmm**		
$KGd_2Fe_4As_4O_2$	a = 0.3897, c = 3.0670	37	
$KTb_2Fe_4As_4O_2$	a = 0.3886, c = 3.0621	37	
$KDy_2Fe_4As_4O_2$	a = 0.3874, c = 3.0598	37	
$KHo_2Fe_4As_4O_2$	a = 0.3866, c = 3.0597	36	
$RbSm_2Fe_4As_4O_2$	a = 0.3921, c = 3.1381	36	
$RbGd_2Fe_4As_4O_2$	a = 0.3901, c = 3.1343	35	
$RbTb_2Fe_4As_4O_2$	a = 0.3890, c = 3.1277	35	
$RbDy_2Fe_4As_4O_2$	a = 0.3879, c = 3.1265	34	
$RbHo_2Fe_4As_4O_2$	a = 0.3869, c = 3.1242	34	
$CsNd_2Fe_4As_4O_2$	a = 0.3949, c = 3.223	35	
$CsSm_2Fe_4As_4O_2$	a = 0.3926, c = 3.2124	35	
$CsGd_2Fe_4As_4O_2$	a = 0.3907, c = 3.2051	33	
$CsTb_2Fe_4As_4O_2$	a = 0.3895, c = 3.1982	33	
$CsDy_2Fe_4As_4O_2$	a = 0.3888, c = 3.1961	33	
$CsHo_2Fe_4As_4O_2$	a = 0.3876, c = 3.1949	33	
$KCa_2Fe_4As_4F_2$	a = 0.3868, c = 3.1007	33	
$RbCa_2Fe_4As_4F_2$	a = 0.3872, c = 3.1667	30	
$CsCa_2Fe_4As_4F_2$	a = 0.3881, c = 3.2363	28	
$BaTh_2Fe_4As_4(N_{0.7}O_{0.3})_2$	a = 0.3989, c = 2.9853	30	
42214 ("221"+2×1111)	**I4/mmm**		
$Pr_4Fe_2As_2Te_{0.88}O_4$	a = 0.4016, c = 2.9857	25	
$Sm_4Fe_2As_2Te_{0.92}O_4$	a = 0.3964, c = 2.9509	25	
$Sm_4Fe_2As_2Te_{0.72}O_{4-y}F_y$	a = 0.3960, c = 2.9268	40	
$Gd_4Fe_2As_2Te_{0.90}O_4$	a = 0.3935, c = 2.9369	25	
$Gd_4Fe_2As_2Te_{0.92}O_{4-y}F_y$	a = 0.3936, c = 2.9350	45	
10-3-8 and 10-4-8	**P$\bar{1}$**		
$(Ca_{1-x}RE_xFeAs)_{10}Pt_3As_8$	a = 0.8749, b = 0.8753, c = 1.0714	up to 33	x_{max} = 0.14
$(CaFe_{1-x}M_xAs)_{10}Pt_3As_8$		up to 15	M = **Co**, Ni, Pd, **Pt**
$(CaFeAs)_{10}Pt_4As_8$	a = 0.8755, b = 0.8764, c = 1.0690	35	
$(CaFe_{1-x}Ir_xAs)_{10}Ir_4As_8$	P4/n; a = 0.8732, c = 1.0391	16	
32522	**I4/mmm**		
$Ca_3Al_2O_5Fe_2P_2$	a = 0.3715, c = 2.5236	16	
$Ca_3Al_2O_5Fe_2As_2$	a = 0.3742, c = 2.6078	30	
$Ca_{n+1}(Mg,Ti)nO_yFe_2As_2$		up to 47	n = 3, **4**; $y \approx 3n$-1
$Ca_{n+1}(Sc,Ti)nO_yFe_2As_2$		up to 42	n = 3, 4, **5**; $y \approx 3n$-1
$Sr_3Sc_2O_5Fe_2As_2$	a = 0.4069, c = 2.6876	0	
$Sr_4(Sc,Ti)_3O_8Fe_2As_2$		28	
$Ba_3Sc_2O_5Fe_2As_2$	a = 0.4133, c = 2.8355	0	
$Ba_4Sc_3O_{7.5}Fe_2As_2$	a = 0.4123, c = 3.7565	11	

Mol. form.	Structure (lattice parameters in nm)	T_c^{max}/K	Comments
42622	**P4/mmm**		
$Ca_4Al_2O_6Fe_2P_2$	a = 0.3693, c = 1.4927	17	
$Ca_4Al_2O_6Fe_2As_2$	a = 0.3713, c = 1.5404	28	
$Ca_5(Al,Ti)_3O_9Fe_2As_2$		39	
$Ca_6(Al,Ti)_4O_{12}Fe_2As_2$		36	
$Ca_8(Mg,Ti)_6O_{18}Fe_2As_2$		40	
$Sr_4Sc_2O_6Fe_2P_2$	a = 0.4016, c = 1.5543	17	
$Sr_4V_2O_6Fe_2As_2$	a = 0.3930, c = 1.5673	37	
$Sr_4(Mg,Ti)_2O_6Fe_2As_2$	a = 0.3935, c = 1.5952	39	

TABLE 9. Crystal Structures and Critical Temperatures of Other Non-Cuprate High-Temperature Superconductors

Mol. form.	Structure (lattice parameters in nm)	T_c^{max}/K
MgB_2	P6/mmm; a = 0.3074, c = 0.3534	39
$Ba_{0.6}K_{0.4}BiO_3$	$Pm\bar{3}m$; a = 0.4287	32