

substance: Fe₃O₄

property: lattice parameters, thermal expansion, density, high temperature phase

lattice parameters

<i>a</i>	8.3940(5) Å	<i>T</i> = 295 K	see also Fig. 1	51T
	8.3905 Å	<i>T</i> = 165 K		
	8.3940 Å	<i>T</i> = 298 K		82I
	8.386 Å	<i>T</i> = 130 K		76S
	8.3963 Å	<i>T</i> = 298 K		65G
	8.4135 Å	<i>T</i> = 473 K		
	8.4374 Å	<i>T</i> = 673 K		
	8.4556 Å	<i>T</i> = 798 K		
	8.4625 Å	<i>T</i> = 823 K		
	8.4658 Å	<i>T</i> = 848 K		
	8.4724 Å	<i>T</i> = 873 K		
	8.4731 Å	<i>T</i> = 888 K		
	8.4746 Å	<i>T</i> = 898 K		
	8.4783 Å	<i>T</i> = 923 K		
	8.4804 Å	<i>T</i> = 948 K		
	8.4821 Å	<i>T</i> = 973 K		
	8.4956 Å	<i>T</i> = 1073 K		
	8.5336 Å	<i>T</i> = 1273 K		
		Fe ₂ O ₃ /FeO =		
	8.379 Å	1.013	variation with stoichiometry; RT values	41V
	8.381 Å	1.021		
	8.381 Å	1.042		
	8.379 Å	1.049		
	8.375 Å	1.020		
<i>d</i> (Fe–O)	2.0590(16) Å	Fe on d-sites		
	1.8871(29) Å	Fe on a-sites		
<i>d</i> (O–O)	3.0817(46) Å	for the three		58H
	2.9689 (3) Å	inequivalent		
	2.8588 (46) Å	pairs of sites		

lattice constant after equilibration under various oxygen pressures

			equilibration at 1400°C; <i>p</i> _{O₂} [atm]	69B
<i>a</i>	8.3960 Å	<i>T</i> = 298 K	10 ^{−6}	
	8.3953 Å		10 ^{−4}	
	8.3943 Å		10 ^{−2}	
	8.3938 Å		10 ^{−1.5}	
	8.3933 Å		10 ^{−1}	
	8.3925 Å		10 ^{−0.7}	

pressure dependence of *a*

<i>da/dp</i>	− 1.5·10 ^{−3} Å kbar ^{−1}	69S
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linear thermal expansion coefficient

α	$10.41 \cdot 10^{-6} \text{ K}^{-1}$	$T = 25^{\circ}\text{C}$	65G
	$11.38 \cdot 10^{-6} \text{ K}^{-1}$	$T = 100^{\circ}\text{C}$	
	$12.68 \cdot 10^{-6} \text{ K}^{-1}$	$T = 200^{\circ}\text{C}$	
	$13.97 \cdot 10^{-6} \text{ K}^{-1}$	$T = 300^{\circ}\text{C}$	
	$15.26 \cdot 10^{-6} \text{ K}^{-1}$	$T = 400^{\circ}\text{C}$	
	$16.54 \cdot 10^{-6} \text{ K}^{-1}$	$T = 500^{\circ}\text{C}$	
	$19.05 \cdot 10^{-6} \text{ K}^{-1}$	$T = 700^{\circ}\text{C}$	
	$20.35 \cdot 10^{-6} \text{ K}^{-1}$	$T = 800^{\circ}\text{C}$	
	$21.61 \cdot 10^{-6} \text{ K}^{-1}$	$T = 900^{\circ}\text{C}$	
	$22.85 \cdot 10^{-6} \text{ K}^{-1}$	$T = 1000^{\circ}\text{C}$	

density

d	5.238 g cm^{-3}	X-ray density	55W
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References:

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Fig. 1.

Fe_3O_4 . Lattice constant vs. temperature for three specimens [65G].

