

# Oxidation State Of Barium

The manganate(VI) ion is a d1 ion and is tetrahedral with bond angles of approximately 109.5°. The Mn–O bond lengths in BaMnO4 and K2MnO4 are identical at 1.66 Å. In comparison, the Mn-O bond length in MnO2–4 is longer than in MnO4– of 1.56 Å and shorter than the Mn–O bond found in MnO2, 1.89 Å. Barium manganate is isomorphous with BaCrO4 and BaSO4. Barium manganate can appear as a dark blue or green to black crystals. Barium manganate is indefinitely stable, active and can be stored for months in dry conditions. 1e780994ea It is part of the more general group of rare-earth barium copper oxides (ReBCO) in which, instead of yttrium, other rare earths are present. 1e780994ea It is most known for its use in the Brin process, named after its inventors, a reaction that was used as a large scale method to produce oxygen before air separation became the dominant method in the beginning of the 20th century, as BaO can be a source of pure oxygen through heat fluctuation... 1e780994ea It is prepared by heating barium carbonate with coke, carbon black or tar or by thermal decomposition of barium nitrate. 1e780994ea

Yttrium barium copper oxide Yttrium barium copper oxide (YBCO) is a family of crystalline chemical compounds that display high-temperature superconductivity; it includes the first Yttrium barium copper oxide (YBCO) is a family of crystalline chemical compounds that display high-temperature superconductivity; it includes the first material ever discovered to become superconducting above the boiling point of liquid nitrogen [77 K (–196. 1 °F)] at about 93 K (–180. 3 °F). 2 °C; –321. 2 °C; –292 1e780994ea

== Properties == 1e780994ea Barium ferrite has been considered for long term data storage. The material has proven to be resistant to a number of different environmental stresses, including humidity and corrosion. Because ferrites are already oxidized it can not be oxidized... 1e780994ea

Barium silvery-white color of barium metal rapidly vanishes upon oxidation in air yielding a dark gray layer containing the oxide. Barium has a medium specific Barium is a chemical element; it has symbol Ba and atomic number 56. Because of its high chemical reactivity, barium is never found in nature as a free element. It is the fifth element in group 2 and is a soft, silvery alkaline earth metal 1e780994ea

Oxidation states are typically represented by integers which may be positive, zero, or negative. In some cases, the average oxidation state of an element is a fraction, such as 8/3 for iron in magnetite Fe3O4 (see below). The highest known oxidation state is +9, displayed by iridium in the tetroxoiridium(IX) cation (IrO+4). An even higher +10 is predicted... 1e780994ea == Uses == 1e780994ea X-ray diffraction has been used to determine the orthorhombic unit cell structure (lattice vectors  $a \neq b \neq c$ , interaxial angles  $\alpha=\beta=\gamma=90^\circ$ ) of nanocrystalline BaFeO4. It crystallized in the Pnma space group (point group: D2h) with lattice parameters  $a = 0.8880$  nm,  $b = 0.5512$  nm and  $c = 0.7214$  nm. The accuracy of the X-Ray diffraction data has been verified by the lattice fringe intervals from High-Resolution Transmission Electron Microscopy (HRTEM) and cell parameters calculated from Selected Area Diffraction (SAED). 1e780994ea

Barium ferrite This compound and related ferrite materials are components in magnetic stripe cards and loudspeaker magnets. solid state chemistry. Barium ferrite is a highly magnetic material, has a high packing density,[clarification needed] and is a metal oxide. Studies of this Barium ferrite, or barium hexaferrite, is an inorganic compound with the chemical formula BaFe12O19 (BaO : 6 Fe2O3), sometimes abbreviated BaFe, BaM 1e780994ea

== Properties == 1e780994ea Many YBCO compounds have the general formula YBa2Cu3O7–x (also known as Y123), although materials with other Y:Ba:Cu ratios exist, such as YBa2Cu4Oy (Y124) or Y2Ba4Cu7Oy (Y247). At present, there is no singularly recognised theory for high-temperature superconductivity. 1e780994ea

Barium ferrate The ferrate(VI) ion has two unpaired electrons, making it paramagnetic. This is a rare compound containing iron in the +6 oxidation state. The ferrate(VI) ion has two Barium ferrate is the chemical compound of formula BaFeO4. This is a rare compound containing iron in the +6 oxidation state. Barium ferrate is the chemical compound of formula BaFeO4. It is isostructural with BaSO4, and contains the tetrahedral [FeO4]2– anion 1e780994ea

Barium manganate Manganate should not be confused with permanganate which contains manganese(VII). It belongs to a class of compounds known as manganates in which the manganese resides in a +6 oxidation state. Manganate should not be confused with permanganate which contains manganese(VII). Barium manganate is a powerful oxidant, popular in organic synthesis and can be used in a wide variety of oxidation reactions. manganese resides in a +6 oxidation state. It is used as an oxidant in organic chemistry. Barium manganate is a powerful Barium manganate is an inorganic compound with the formula BaMnO4 1e780994ea

== Properties == 1e780994ea The most common minerals of barium are barite (barium sulfate,  $\text{BaSO}_4$ ) and witherite (barium carbonate,  $\text{BaCO}_3$ ). The name barium originates from the alchemical derivative "baryta" from Greek βάρυς (barys), meaning 'heavy'. Baric is the adjectival form of barium. Barium was identified as a new element in 1772, but not reduced to a metal until 1808 with the advent of electrolysis. 1e780994ea

Oxidation state average oxidation state of an element is a fraction, such as  $\frac{8}{3}$  for iron in magnetite  $\text{Fe}_3\text{O}_4$  (see below). Conceptually, the oxidation state may be positive, negative or zero. Oxidation state is useful for estimating the distribution of electric charge within molecules, especially for those containing primarily ionic bonds, and less so for those with primarily covalent bonds. The highest known oxidation state is +9, displayed In chemistry, the oxidation state, or oxidation number, is the hypothetical charge of an atom assuming all of its bonds to other atoms are fully ionic. It describes the degree of oxidation (loss of electrons) of an atom in a chemical compound 1e780994ea

== Preparation and structure == 1e780994ea Barium borate was discovered and developed by Chen Chuangtian and others of the Fujian Institute of Research on the Structure of Matter, Chinese Academy of Sciences. 1e780994ea

Barium oxide Excessive quantities of barium oxide may lead to death. It has a cubic structure and is used in cathode-ray Barium oxide, also known as baria, is a white hygroscopic non-flammable compound with the formula  $\text{BaO}$ . It is harmful to human skin and if swallowed in large quantity causes irritation. It has a cubic structure and is used in cathode-ray tubes, crown glass, and catalysts. Barium oxide, also known as baria, is a white hygroscopic non-flammable compound with the formula  $\text{BaO}$  1e780994ea

Barium hydroxide This white granular monohydrate is the usual commercial form. This white granular monohydrate is the usual commercial form. The monohydrate ( $x = 1$ ), known as baryta or baryta-water, is one of the principal compounds of barium. compounds of barium. Barium hydroxide can be prepared by dissolving barium oxide ( $\text{BaO}$ ) in Barium hydroxide is a chemical compound with the chemical formula  $\text{Ba}(\text{OH})_2$  1e780994ea

Barium peroxide consists of barium cations  $\text{Ba}^{2+}$  and peroxide anions  $\text{O}_2^{2-}$ . The solid is isomorphous to calcium carbide,  $\text{CaC}_2$ . 1e780994ea  $\text{BaFe}$  is described as  $\text{Ba}_2\text{Fe}_3\text{O}_{19}$ . The  $\text{Fe}^{3+}$  centers are ferrimagnetically coupled, and one unit cell of  $\text{BaM}$  has a net magnetic moment of  $40\mu\text{B}$ . This area of technology is usually considered to be an application of the related fields of materials science and solid state chemistry. 1e780994ea Barium ferrite is a highly magnetic material, has a high packing density, and is a metal oxide. Studies of this material date at least as far back as 1931, and it has found applications in magnetic card strips, speakers, and magnetic tapes. One area in particular it has found success in is long-term data storage; the material is magnetic, resistant to temperature change, corrosion and oxidization. 1e780994ea == Structure == 1e780994ea In April 1986, Georg Bednorz and Karl Müller, working at IBM in Zurich, discovered that certain semiconducting oxides became superconducting at relatively high temperature, in particular, a lanthanum barium copper oxide becomes superconducting at 35 K. This oxide was an oxygen-deficient perovskite-related material that proved promising and stimulated the search for related compounds with higher superconducting transition temperatures. In 1987, Bednorz and Müller... 1e780994ea The oxidation state of an atom is capable of qualitative explanation of patterns in chemical reactions. It does not represent an atom's actual charge. The oxidation states of atoms in a given compound may vary depending on the electronegativity scale used. It is also relevant to the nomenclature conventions of inorganic compounds. 1e780994ea The ferrate(VI) anion is paramagnetic due to its two unpaired electrons and it has a tetrahedral molecular geometry. 1e780994ea Barium oxide is used as a coating for hot cathodes, for example, those in cathode-ray tubes. It replaced lead(II) oxide in the production of certain kinds of glass such as optical crown glass. While lead oxide raised the refractive index, it also raised the dispersive power, which barium oxide does not alter. Barium oxide also has use as an ethoxylation catalyst in the reaction of ethylene oxide and alcohols, which takes place between 150 and 200 °C. 1e780994ea Barium has few industrial applications. Historically, it was used as a getter for vacuum tubes and in oxide form as the emissive coating on indirectly heated cathodes. It is a component of YBCO (high-temperature superconductors) and electroceramics, and is added to steel and cast iron to reduce the size of carbon grains within the microstructure. Barium compounds are added to fireworks to impart a green color. Barium sulfate is used as an insoluble additive to oil well drilling fluid. In a purer form it is used as X-ray radiocontrast agents for imaging the human gastrointestinal... 1e780994ea == Structure == 1e780994ea

Barium borate It is available as a hydrate or dehydrated form Barium borate is an inorganic compound, a borate of barium with a chemical formula  $\text{BaB}_2\text{O}_4$  or  $\text{Ba}(\text{BO}_2)_2$ . Barium borate is an inorganic compound, a borate of barium with a chemical formula  $\text{BaB}_2\text{O}_4$  or  $\text{Ba}(\text{BO}_2)_2$ . The crystals exist in the high-temperature  $\alpha$  phase and low-temperature  $\beta$  phase, abbreviated as BBO; both phases are birefringent, and BBO is a common nonlinear optical material. It is available as a hydrate or dehydrated form, as white powder or colorless crystals 1e780994ea

Barium hydroxide can be prepared by dissolving barium oxide ( $\text{BaO}$ ) in water: 1e780994ea

Barium peroxide This white solid (gray when impure) is one of the most common inorganic peroxides, and it was the first peroxide compound discovered. This white solid (gray when impure) is one of the most common inorganic peroxides, and Barium peroxide is an inorganic compound with the formula  $\text{BaO}_2$ . Barium peroxide is an inorganic compound with the formula  $\text{BaO}_2$ . Being

an oxidizer and giving a vivid green colour upon ignition (as do all barium compounds), it finds some use in fireworks; historically, it was also used as a precursor for hydrogen peroxide  
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== History == 1e780994ea

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