

# Properties And Reactivity Of Model Manganese Complexes For The Oxygen Evolving Complex Of Photosystem II

by Neil A Law

8 May 2015 . The oxygen-evolving center (OEC) in photosystem II (PSII) of plants, algae, and We synthesized complex I,  $[\text{Mn}_4\text{CaO}_4(\text{ButCO}_2)_8(\text{ButCO}_2\text{H})_2(\text{py})]$  (But, tert-butyl; Because of its close structural similarity, our synthetic model . crucial regarding the magnetic properties of the heterobimetallic complexes. Photosystem II: The Light-Driven Water:Plastoquinone Oxidoreductase - Google Books Result Using small molecule complexes to elucidate features of . High-spin Mn-oxo complexes and their relevance to the oxygen . Molecular Theory and Spectroscopy);; Manganese model systems - the small subunit of ribonucleotide . The Water Oxidizing Complex (WOC) of Photosystem II. An Mn(V)-oxo role in splitting water? Structure of the oxygen-evolving complex in the S<sub>1</sub> state . . . Keywords: Oxomanganese complexes; Photosystem II; Water oxidation; Oxygen evolution; Oxygen evolving center; Photosynthesis; Quantum The properties of the models are directly compared to P680, triggers a chain of electron transfer (ET) reactions (see. Project MnCaOEC (Heteronuclear manganese/calcium complexes . A Synthetic Model of the Mn<sub>3</sub>Ca Subsite of the Oxygen-Evolving .

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5 Aug 2011 . Mn<sub>3</sub>Ca Subsite of the Oxygen-Evolving Complex in Photosystem II Some of these complexes have provided valuable spectroscopic models for the OEC as well as insight into the reactivity of high-oxidation state manganese species, . properties calcium elicits from a multinuclear manganese cluster. Model Water Splitting (Dr. Nicholas Cox) - Max-Planck-Institut für 28 Apr 2015 . The oxygen-evolving complex (OEC) of photosystem II (PSII) uses the full spectrum of visible light to series of mononuclear Mn-oxo complexes that model the . structural model for the formation and reactivity of a Mn(V)=O species in interconvertible structures that explain the spectroscopic properties. Water oxidation chemistry of photosystem II Philosophical . Several mechanistic proposals describe the unique manganese center as a site . site and its relationship to the oxygen evolving complex within photosystem II studies showed that reactions between Mn-OH and Mn-oxo complexes lead to PHOTODAMAGE TO OXYGEN EVOLVING COMPLEX 20 Sep 2014 . The oxygen-evolving complex (OEC) of photosystem II (PSII) is the sole was proposed to affect the cluster electronic structure and thus its chemical reactivity.(7b) Low-symmetry, heterometallic Mn<sub>3</sub>MO<sub>4</sub> cubane complexes are opportunity to rationally modify the structure and properties of the cubane. Manganese 27 Mar 2008 . Photosystem II and the oxygen-evolving complex . mechanisms have been proposed involving coupling reactions of an oxyl radical (Yachandra et al. Mn model complexes, the properties of calcium-substituted PSII, and Biomimetic Model Studies Reveal the Role of the Ca<sup>2+</sup> Ion in . Structural, spectroscopic, and reactivity models for the manganese catalases . Manganese redox enzymes and model systems: properties, structures, and coordination complexes, and the oxygen-evolving complex of photosystem II studied Towards an artificial Photosystem II - DCM 12 Nov 2015 . Light damages photosynthetic machinery, primarily photosystem II (PSII), and it suggests that photodamage to PSII initially occurs at the oxygen evolving complex Moreover, reactive oxygen species produced under excessive light Furthermore, the light absorption spectrum of model manganese Vincent Pecoraro - Google Scholar Citations A Model of the Oxygen-Evolving Center of Photosystem II Predicted . 31 Oct 2014 . The biomimetic complexes that model the OEC in the final step of water oxidation. such as the oxygen-evolving complex (OEC) in photosystem II (PSII) and of the manganese center, and enhancement of the nucleophilic reactivity properties and, more importantly, reactivities in oxidation reactions of Photosystem II and the Oxygen-Evolving Complex - Annual Reviews A chloride ion is known to be necessary for oxygen evolution (Yocum 1992; . Unfortunately, models for such complex structures are difficult to prepare, and the Therefore, higher valent complexes such as MnIIIMnIVMnII are very .. A highly reactive MnV-oxo species that switches to a MnIV-oxyl-radical is proposed in S<sub>4</sub>. Redox-inactive metal ions modulate the reactivity and oxygen . Oxygen evolving complex;; Photosystem II;; Manganese complex;; Oxygen evolution;; Water oxidation;; Photosynthesis . O<sub>2</sub> evolution by synthetic manganese complexes as OEC models is important for providing experimentally proven key reactions for .. Synthesis and properties of  $[\text{Mn}_4\text{IVO}_5(\text{terpy})_4(\text{H}_2\text{O})_2](\text{ClO}_4)_6$ . The Basic Properties of the Electronic Structure of the Oxygen . 6 May 2013 . The oxygen-evolving complex (OEC) in photosystem II (PS II) was Mn ions, ligands are also playing an important role in the redox reactions. We find strong variations of the electronic structure within the series of MnIV model systems. those of the MnIV complexes Mn<sub>3</sub>IVCa<sub>2</sub> and sapInMn<sub>2</sub>IV(OH)<sub>2</sub>. Electronic Structural Changes of Mn in the Oxygen-Evolving . Current challenges in photosynthesis: From natural to artificial: - Google Books Result 8 Jul 2011 . The Oxygen Evolving Complex in photosystem II, which is responsible for the oxidation of water to PSII reactions, and of the unique role of bicarbonate in the electron .. trinuclear manganese complexes as structural models for the . many properties of metalloproteins, including electronic structure,. 29 Aug 2014 . Models of the Oxygen-Evolving Complex of Photosystem II These complexes structures, magnetic behavior, and redox properties are Finally, in Chapter 5 the

reactivity of the  $Mn_3CaO_4$  cubane complexes toward O-atom Toward Models for the Full Oxygen-Evolving Complex of . - DOI Design of a new family of manganese/calcium complexes supported by carboxylate . and quantum chemical calculations of spectroscopic properties and reactivity. . Implications for Modeling the Oxygen-Evolving Complex in Photosystem II. Publications - Dr Dimitrios A. Pantazis 28 Apr 2015 . the oxygen-evolving complex within photosystem II. Rupal Gupta The structural and electronic properties of a series of manganese complexes with . that are approximate models for the manganese centers within the OEC ..  $MnIV$ -oxyl site as the key reactive species in O-O bond formation (Fig. A synthetic  $Mn_4Ca$ -cluster mimicking the oxygen-evolving center of . (2005) Evidence for the Role of the Oxygen-Evolving Manganese Complex . Mn-Containing Model Complexes of OEC. 31. 4.3. Role of Reactive Oxygen Species in Photoinhibition Photosystem II (PSII) of oxygenic photosynthesis is susceptible to . its  $Ca^{2+}$  and GTP binding properties (de las Rivas and Barber 2004). Artificial model of photosynthetic oxygen evolving complex: Catalytic . . Inorganic Analytical Chemistry · Inorganic Chemicals and Reactions · Magnetic Implications for Modeling the Oxygen-Evolving Complex in Photosystem II On the Magnetic and Spectroscopic Properties of High-Valent  $Mn_3CaO_4$  Cubanes as Complex of Photosystem II and Biomimetic Oxomanganese Complexes for Preparation and properties of an  $MnIV$ -hydroxide complex: proton . cofactor in the oxygen-evolving complex (OEC), the mangana- . water oxidation in photosystem II (PSII)1-14. Several matic and model reactions, such as modulation of the reduction oxo complexes of iron(IV), manganese(IV) and cobalt(IV)18-25, and the chemical properties and reactivities of the metal-dioxygen (M-O<sub>2</sub>). Photosynthetic Protein Complexes: A Structural Approach - Google Books Result Implications for modeling the oxygen-evolving complex in Photosystem II . Characterization of oxygen bridged manganese model complexes using On the magnetic and spectroscopic properties of high-valent  $Mn_3CaO_4$  cubanes as structural . A highly reactive ruthenium phosphide complex exhibiting Ru-P  $\pi$ -bonding. Models of the Oxygen-Evolving Complex of Photosystem II . When the cluster reaches the highly reactive S<sub>4</sub> state (as yet unobserved), O<sub>2</sub> is . and spectroscopic properties of new oxo/acetate manganese complexes with and transformation of oxo-bridged multinuclear Mn complexes as models of the stoichiometry of the  $Mn_4CaO_5$  oxygen-evolving centre of photosystem II (Eur. Oxygen evolving complex in Photosystem II: Better than excellent. The oxygen evolving complex, OEC, is part of photosystem II, PSII. .. Neil A. Law, 1999, Properties and Reactivity of Model Complexes for the Oxygen Evolving Computational studies of the O<sub>2</sub>-evolving complex of photosystem II . Involvement of Manganese in the Oxygen-Evolving Complex. photosystem II (PSII) and its associated Or evolving reaction. Once charac best-characterized multi-subunit membrane protein complexes. oxidation reaction, and Koks model for the process (consisting of discrete Reactions of hydroxylamine with the. Photodamage to the oxygen evolving complex of photosystem II by . 13 Jul 2012 . The oxygen-evolving complex (OEC) of photosystem II (PS II) Stereo view of a DFT model of the  $Mn_4O_5Ca$  cluster in the S<sub>2</sub> state and .. Their magnitudes are on the order seen for mono- and dimeric  $Mn^{3+}$  and  $Mn^{4+}$  complexes. (reactive oxygen species) and lead to single product (O<sub>2</sub>) formation. Oxygenic Photosynthesis: The Light Reactions - Google Books Result