

## Products of Cu(II)-catalyzed oxidation of the *N*-terminal fragments of $\alpha$ -synuclein in the presence of hydrogen peroxide.

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### Rok wydania

2006

### Czasopismo

Journal of Inorganic  
Biochemistry

### Numer woluminu

100

### Strony

1623-1631

### DOI

10.1016/j.jinorgbio.2006.05.010

### Kolekcja

Naukowa

### Język

Angielski

### Typ publikacji

Artykuł

### Streszczenie

Reactive oxygen species (ROS) may provide the covalent modifications of amino acid residues in proteins, formation of protein-protein cross-linkages, and oxidation of the protein backbone resulting in protein fragmentation. In an attempt to elucidate the products of the copper(II)-catalyzed oxidation of the (1-17), (1-28), (1-39) and (1-39)(A30P) fragments of  $\alpha$ -synuclein, the high performance liquid chromatography (HPLC) and matrix-assisted laser desorption/ionization time-of-flight mass spectrometry (MALDI-TOF MS) methods and Cu(II)/hydrogen peroxide as a model oxidizing system were employed. Peptide solution (0.50 mM) was incubated at 37 °C for 24 h with metal:peptide:hydrogen peroxide molar ratio 1:1:4 in phosphate buffer, pH 7.4. Oxidation targets for all peptide studied are the methionine residues (M<sup>1</sup>, M<sup>5</sup>). Incubation 24 h of the (1-28), (1-39) and (1-39)(A30P) fragments in aerobic conditions lead to the oxidation of one methionine residue to methionine sulfoxide. Reaction of hydrogen peroxide with all fragments of  $\alpha$ -synuclein resulted in oxidation of two methionine residues (M<sup>1</sup>, M<sup>5</sup>) to methionine sulfoxides. For the Cu(II):peptide:hydrogen peroxide 1:1:4 molar ratio systems the further oxidation of methionine residues to sulfone was observed. The cleavage of the peptide bond M<sup>1</sup>-D<sup>2</sup> for all peptides studied was observed as metal binding residues. For the (1-39) and (1-39)(A30P) fragments of  $\alpha$ -synuclein the molecular ions with lower molecular masses (A<sup>11</sup>-Y<sup>39</sup>, E<sup>13</sup>-Y<sup>39</sup>) were also detected.

### Słowa kluczowe

$\alpha$ -Synuclein, Metal-catalyzed oxidation, Copper(II) complexes, Products of oxidation, MALDI-TOF MS

### Adres publiczny

<https://doi.org/10.1016/j.jinorgbio.2006.05.010>

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Plik został wygenerowany dnia 2026-05-09 22:46:41

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