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## Electro-catalyst based on cerium doped cobalt oxide for oxygen evolution reaction in electrochemical water splitting

By: Khan, SA (Khan, Shahid Ali)<sup>[1,2]</sup>; Khan, SB (Khan, Sher Bahadar)<sup>[1,2]</sup>; Asiri, AM (Asiri, Abdullah M.)<sup>[1,2]</sup>

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### Abstract

Several doped cobalt oxide nanomaterials such as cerium doped cobalt oxide-1, cerium doped cobalt oxide-2, titanium doped cobalt oxide and iron doped cobalt oxide were synthesized and their catalytic activities in electrochemical water splitting were checked for oxygen evolution reaction. The catalytic activity of doped cobalt oxide nanomaterials were observed in potassium hydroxide solution and among all synthesized nanomaterials, the strongest catalytic activity was displayed by cerium doped cobalt oxide-2 nanoparticle in water splitting. Cerium doped cobalt oxide-2 exhibit higher current density at lower over potential and lower Tafel slope as compared to all other studied cobalt based nanomaterials. At 1.0 V, cerium oxide doped cobalt oxide-2 supplied a current density of 39.2 mA/cm<sup>2</sup> in 0.3 M potassium hydroxide solution. Thus cerium doped cobalt oxide-2 exhibit superior electrocatalytic performance and therefore cerium doped cobalt oxide-2 is an attractive finding for superior oxygen evolution in water splitting.

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### Author Information

Reprint Address: Khan, SB (reprint author)

King Abdulaziz Univ, CEAMR, POB 80203, Jeddah 21589, Saudi Arabia.

#### Organization-Enhanced Name(s)

King Abdulaziz University

Reprint Address: Khan, SB (reprint author)

King Abdulaziz Univ, Dept Chem, Fac Sci, POB 80203, Jeddah 21589, Saudi Arabia.

#### Organization-Enhanced Name(s)

King Abdulaziz University

### Addresses:

[ 1 ] King Abdulaziz Univ, CEAMR, POB 80203, Jeddah 21589, Saudi Arabia

#### Organization-Enhanced Name(s)

King Abdulaziz University

[ 2 ] King Abdulaziz Univ, Dept Chem, Fac Sci, POB 80203, Jeddah 21589, Saudi Arabia

#### Organization-Enhanced Name(s)

King Abdulaziz University

E-mail Addresses: [drkhanmarwat@gmail.com](mailto:drkhanmarwat@gmail.com)

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