

# Circular Economy Ontology Network (CEON) - Material Module

## Metadata

### IRI

<http://w3id.org/CEON/ontology/material/>

### Title

Circular Economy Ontology Network (CEON) - Material Module

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### Version Iri

<http://w3id.org/CEON/ontology/material/0.1/>

### Version Info

0.1

### Preferred Namespace Prefix

material

### Preferred Namespace Uri

<http://w3id.org/CEON/ontology/material/>

### Description

The Material module of CEON (Circular Economy Ontology Network).

### Covers Requirements

In addition to requirements covered by imported ODPs, covers the following requirements from Onto-DESIDE D3.1: CVN-Resource-2, CVN-ResourceType-4, C3-3, E1-3, E2-4, E5-2, T1-1, T10-2.

## Classes

### Chemical entity<sup>C</sup>

#### IRI

<http://w3id.org/CEON/ontology/material/ChemicalEntity>

#### Description

A chemical entity is an abstraction of entities that can compose matter. For instance, a chemical entity can be a molecular entity or a chemical substance.

#### Sub Class Of

[resourceODP:Matter<sup>C</sup>](#)

#### In Range Of

[has chemical entity<sup>OP</sup>](#)

#### Super Class Of

[Chemical substance<sup>C</sup>](#)  
[Molecular entity<sup>C</sup>](#)

## Chemical substance<sup>C</sup>

|                     |   |
|---------------------|---|
| <b>IRI</b>          | <a href="http://w3id.org/CE0N/ontology/material/ChemicalSubstance">http://w3id.org/CE0N/ontology/material/ChemicalSubstance</a> |
| <b>Description</b>  | A chemical substance is made up of a collection of molecular entities.  |
| <b>Sub Class Of</b> | <a href="#">Chemical entity<sup>C</sup></a>   |

## Material<sup>C</sup>

|                     |  |
|---------------------|--|
| <b>IRI</b>          | <a href="http://w3id.org/CE0N/ontology/material/Material">http://w3id.org/CE0N/ontology/material/Material</a>                |
| <b>Description</b>  | Material as a sub-concept of Matter, can be a substance or a collection of substance which a physical object is composed of. |
| <b>Sub Class Of</b> | <a href="#">resourceODP:Matter<sup>C</sup></a>   |
| <b>In Domain Of</b> | <a href="#">has chemical entity<sup>OP</sup></a><br><a href="#">has material component<sup>OP</sup></a>                      |
| <b>Restriction</b>  | <a href="#">has chemical entity<sup>OP</sup></a> some <a href="#">Material<sup>C</sup></a>                                   |

## Material component<sup>C</sup>

|                     |   |
|---------------------|---|
| <b>IRI</b>          | <a href="http://w3id.org/CE0N/ontology/material/MaterialComponent">http://w3id.org/CE0N/ontology/material/MaterialComponent</a> |
| <b>Description</b>  | A material component is a part of a material.   |
| <b>Sub Class Of</b> | <a href="#">resourceODP:Constituent<sup>C</sup></a>   |
| <b>In Range Of</b>  | <a href="#">has material component<sup>OP</sup></a>   |

## Molecular entity<sup>C</sup>

|                     |   |
|---------------------|---|
| <b>IRI</b>          | <a href="http://w3id.org/CE0N/ontology/material/MolecularEntity">http://w3id.org/CE0N/ontology/material/MolecularEntity</a> |
| <b>Description</b>  | A molecular entity means a singular/distinguishable entity. It can be for instance, atom, ion.                              |
| <b>Sub Class Of</b> | <a href="#">Chemical entity<sup>C</sup></a>   |

## Constituent<sup>C</sup>

|                       |   |
|-----------------------|---|
| <b>IRI</b>            | <a href="http://w3id.org/CE0N/ontology/resourceODP/Constituent">http://w3id.org/CE0N/ontology/resourceODP/Constituent</a> |
| <b>Super Class Of</b> | <a href="#">Material component<sup>C</sup></a>  |

## Matter<sup>c</sup>

**IRI** <http://w3id.org/CE0N/ontology/resource0DP/Matter>

**Super Class Of**  
[Chemical entity<sup>c</sup>](#)  
[Material<sup>c</sup>](#)

## Object Properties

### has chemical entity<sup>op</sup>

**IRI** <http://w3id.org/CE0N/ontology/material/hasChemicalEntity>

**Description**  
hasChemicalEntity intends to represent that a material can have a collection of chemical entities.

**Domain** [Material<sup>c</sup>](#)

**Range** [Chemical entity<sup>c</sup>](#)

### has material component<sup>op</sup>

**IRI** <http://w3id.org/CE0N/ontology/material/hasMaterialComponent>

**Description**  
hasMaterialComponent intends to represent that a material can have a collection of components.

**Domain** [Material<sup>c</sup>](#)

**Range** [Material component<sup>c</sup>](#)

## Datatype Properties

### Anonymous Formula<sup>dp</sup>

**IRI** <http://w3id.org/CE0N/ontology/material/AnonymousFormula>

**Description**  
AnonymousFormula represents that a molecular entity has the anonymous formula in a string.

### Descriptive Formula<sup>dp</sup>

**IRI** <http://w3id.org/CE0N/ontology/material/DescriptiveFormula>

**Description**  
DescriptiveFormula represents that a molecular entity has the descriptive formula in a string.

## Hill Formula<sup>dp</sup>

|                    |   |
|--------------------|---|
| <b>IRI</b>         | <a href="http://w3id.org/CE0N/ontology/material/HillFormula">http://w3id.org/CE0N/ontology/material/HillFormula</a> |
| <b>Description</b> | HillFormula represents that a composition has the hill formula in a string.   |

## Reduced Chemical Formula<sup>dp</sup>

|                    |   |
|--------------------|---|
| <b>IRI</b>         | <a href="http://w3id.org/CE0N/ontology/material/ReducedChemicalFormula">http://w3id.org/CE0N/ontology/material/ReducedChemicalFormula</a> |
| <b>Description</b> | ReducedChemicalFormula represents that a molecular entity has the reduced chemical formula in a string.                                   |

## Annotation Properties

### description<sup>ap</sup>

|            |   |
|------------|---|
| <b>IRI</b> | <a href="http://purl.org/dc/elements/1.1/description">http://purl.org/dc/elements/1.1/description</a> |
|------------|---|

## Namespaces

:

<http://w3id.org/CE0N/ontology/material/>

**dc**

<http://purl.org/dc/elements/1.1/>

**dcterms**

<http://purl.org/dc/terms/>

**odp**

<http://www.ontologydesignpatterns.org/schemas/cpannotationschema.owl#>

**owl**

<http://www.w3.org/2002/07/owl#>

**prov**

<http://www.w3.org/ns/prov#>

**rdf**

<http://www.w3.org/1999/02/22-rdf-syntax-ns#>

**rdfs**

<http://www.w3.org/2000/01/rdf-schema#>

**resourceODP**

<http://w3id.org/CE0N/ontology/resourceODP/>

**vann**

<http://purl.org/vocab/vann/>

## Legend

|    |                          |
|----|--------------------------|
| c  | Classes                  |
| op | Object<br>Properties     |
| dp | Datatype<br>Properties   |
| ap | Annotation<br>Properties |