

# 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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### License

<https://github.com/LiUSemWeb/CEON/blob/master/LICENSE>

### Version Iri

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

### Version Info

0.1

### Preferred Namespace Prefix

material

### Preferred Namespace Uri

<http://w3id.org/CEON/ontology/0.1/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, E1-1, E1-3, E2-4, E5-2, T1-1, T10-2.

## Classes

## ChemicalEntity<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** [hasChemicalEntity<sup>op</sup>](#)

**Super Class Of**  
[ChemicalSubstance<sup>C</sup>](#)  
[MolecularEntity<sup>C</sup>](#)

## ChemicalSubstance<sup>C</sup>

**IRI** <http://w3id.org/CEON/ontology/material/ChemicalSubstance>

**Description**

A chemical substance is made up of a collection of molecular entities.

**Sub Class Of** [ChemicalEntity<sup>C</sup>](#)

## Material<sup>C</sup>

**IRI** <http://w3id.org/CEON/ontology/material/Material>

**Description**

Material as a sub-concept of Matter, can be a substance or a collection of substance which a physical object is composed of.

**Sub Class Of** [resourceODP:Matter<sup>C</sup>](#)

**In Domain Of**  
[hasChemicalEntity<sup>op</sup>](#)  
[hasMaterialComponent<sup>op</sup>](#)

**Restriction** [hasChemicalEntity<sup>op</sup>](#) some [Material<sup>C</sup>](#)

## MaterialComponent<sup>c</sup>

**IRI** <http://w3id.org/CEON/ontology/material/MaterialComponent>

**Description** A material component is a part of a material.

**Sub Class Of** [resourceODP:Constituent<sup>c</sup>](#)

**In Range Of** [hasMaterialComponent<sup>op</sup>](#)

## MolecularEntity<sup>c</sup>

**IRI** <http://w3id.org/CEON/ontology/material/MolecularEntity>

**Description** A molecular entity means a singular/distinguishable entity. It can be for instance, atom, ion.

**Sub Class Of** [ChemicalEntity<sup>c</sup>](#)

## Constituent<sup>c</sup>

**IRI** <http://w3id.org/CEON/ontology/resourceODP/Constituent>

**Super Class Of** [MaterialComponent<sup>c</sup>](#)

## Matter<sup>c</sup>

**IRI** <http://w3id.org/CEON/ontology/resourceODP/Matter>

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

## Physical Object<sup>c</sup>

**IRI** <http://w3id.org/CEON/ontology/resourceODP/PhysicalObject>

## Resource<sup>c</sup>

**IRI** <http://w3id.org/CEON/ontology/resourceODP/Resource>

## Object Properties

### hasChemicalEntity<sup>op</sup>

|                    |   |
|--------------------|---|
| <b>IRI</b>         | <a href="http://w3id.org/CEON/ontology/material/hasChemicalEntity">http://w3id.org/CEON/ontology/material/hasChemicalEntity</a> |
| <b>Description</b> | hasChemicalEntity intends to represent that a material can have a collection of chemical entities.                              |
| <b>Domain</b>      | <a href="#">Material</a> <sup>c</sup>   |
| <b>Range</b>       | <a href="#">ChemicalEntity</a> <sup>c</sup>   |

### hasMaterialComponent<sup>op</sup>

|                    |   |
|--------------------|---|
| <b>IRI</b>         | <a href="http://w3id.org/CEON/ontology/material/hasMaterialComponent">http://w3id.org/CEON/ontology/material/hasMaterialComponent</a> |
| <b>Description</b> | hasMaterialComponent intends to represent that a material can have a collection of components.  |
| <b>Domain</b>      | <a href="#">Material</a> <sup>c</sup>   |
| <b>Range</b>       | <a href="#">MaterialComponent</a> <sup>c</sup>  |

## Datatype Properties

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

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

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

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

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

**IRI** <http://w3id.org/CEON/ontology/material/HillFormula>

### Description

HillFormula represents that a composition has the hill formula in a string.

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

**IRI** <http://w3id.org/CEON/ontology/material/ReducedChemicalFormula>

### Description

ReducedChemicalFormula represents that a molecular entity has the reduced chemical formula in a string.

## Annotation Properties

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

**IRI** <http://purl.org/dc/elements/1.1/description>

## Namespaces

### dc

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

### dcterms

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

### material

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

### 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/CEON/ontology/resourceODP/>

### vann

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

## Legend

c

op

dp

ap

Classes

Object Properties

Datatype Properties

Annotation Properties