



# Modified Atmosphere Packaging for fresh produce

Valérie Guillard

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Submitted on 5 Jun 2020

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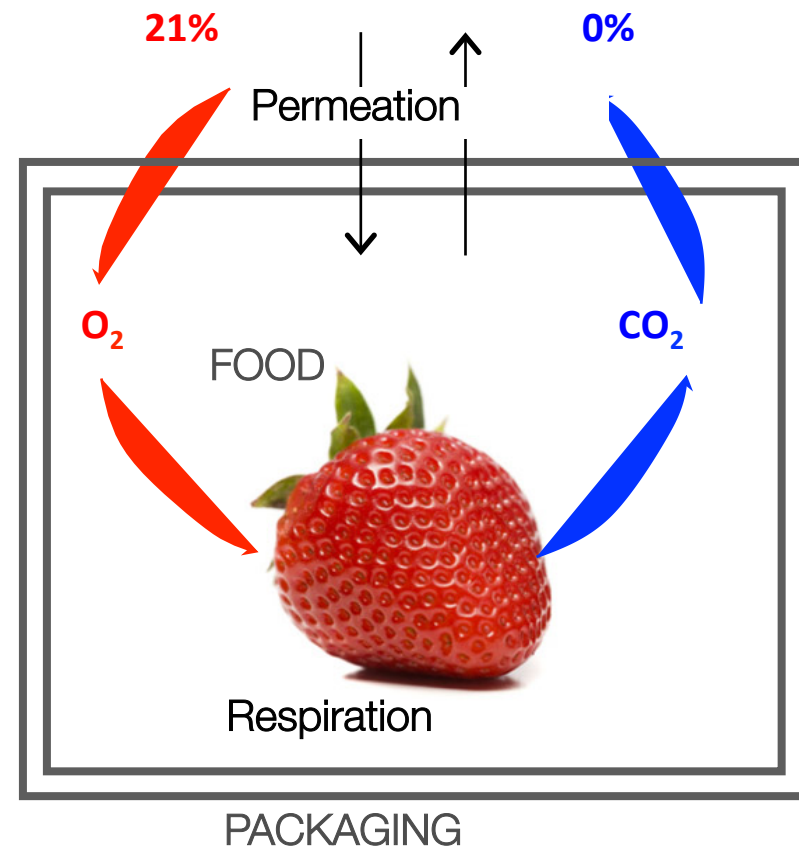
# Modified Atmosphere Packaging for fresh produce

Valérie Guillard

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# ECOBIOCAP A Decision Support System ...

EcoBioCap - Optimize permeabilities

### Food properties

Apple fresh-cut Annurca

Mass (kg):

Shelf life (day):

Temperature (°C):

Optimal atmosphere value:

O<sub>2</sub> (%):

CO<sub>2</sub> (%):

Respiration properties:

RRO<sub>2</sub> max (mmole/kg/h):

RQ (RRCO<sub>2</sub> / RRO<sub>2</sub>):

KmO<sub>2</sub> (Pa):

KmCO<sub>2</sub> (Pa):

### Packaging geometry

Surface (cm<sup>2</sup>):

Volume (l):

run simulation

clear

Permeance O<sub>2</sub> (mol.m-2.s-1.Pa-1)

Permeance CO<sub>2</sub> (mol.m-2.s-1.Pa-1)

Permeability O<sub>2</sub> (mol.m-1.s-1.Pa-1 - 50 µm)

Permeability CO<sub>2</sub> (mol.m-1.s-1.Pa-1 - 50 µm)

### Preferences associated with criteria

☒ allow the ranking of packagings with unknown values for mandatory criteria

	enlarge min	min	max	enlarge max	mandatory	optional
O <sub>2</sub> permeance					<input type="checkbox"/>	<input type="checkbox"/>
CO <sub>2</sub> permeance					<input type="checkbox"/>	<input type="checkbox"/>
Temperature					<input type="checkbox"/>	<input type="checkbox"/>
Biodegradability	<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>
Transparency	transparent translucent opaque				<input type="checkbox"/>	<input type="checkbox"/>

rank packagings

# ECOBIOCAP A Decision Support System ...

Chose of a fresh produce among a list of possibilities

ECOBIOCAP - Optimize permeabilities

**Food properties**  

Endive

Apple fresh-cut Annurca  
Apricot A3844  
Apricot Bergeron  
Artichoke  
cucumber  
**Endive**  
Lettuce Lactuca sativa L.  
Mushroom Agaricus bisporus Lange  
Onion Allium cepa  
Strawberry Charlotte  
Strawberry Fragaria x ananassa Duchesne  
Tomato Grace

KmO2 (Pa): 9260  
KmCO2 (Pa):

**Packaging geometry**  
Surface (cm²):  
Volume (l):

run simulation

clear

Permeance O2  
(mol.m-2.s-1.Pa-1)

Permeance CO2  
(mol.m-2.s-1.Pa-1)

Permeability O2  
(mol.m-1.s-1.Pa-1 - 50 µm)

Permeability CO2  
(mol.m-1.s-1.Pa-1 - 50 µm)

**Preferences associated with criteria**  
☒ allow the ranking of packagings with unknown values for mandatory criteria

	enlarge min	min	max	enlarge max	mandatory	optional
O2 permeance					<input type="checkbox"/>	<input type="checkbox"/>
CO2 permeance					<input type="checkbox"/>	<input type="checkbox"/>
Temperature					<input type="checkbox"/>	<input type="checkbox"/>
Biodegradability	<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>
Transparency	transparent translucent opaque				<input type="checkbox"/>	<input type="checkbox"/>

# ECOBIOCAP A Decision Support System ...

EcoBioCap - Optimize permeabilities

**Food properties**

Endive

Mass (kg): 0.5

Shelf life (day): 7

Temperature (°C):

Optimal atmosphere value:

O<sub>2</sub> (%): 5

CO<sub>2</sub> (%): 4

Respiration properties:

RRO<sub>2</sub> max (mmole/kg/h): 1.1833729665147

RQ (RRCO<sub>2</sub> / RRO<sub>2</sub>): 0.74

KmO<sub>2</sub> (Pa): 9260

KmCO<sub>2</sub> (Pa): 10000

**Packaging geometry**

Surface (cm<sup>2</sup>):

Volume (l):

Permeance O<sub>2</sub> (mol.m-2.s-1.Pa-1)

Permeance CO<sub>2</sub> (mol.m-2.s-1.Pa-1)

Permeability O<sub>2</sub> (mol.m-1.s-1.Pa-1 - 50 µm)

Permeability CO<sub>2</sub> (mol.m-1.s-1.Pa-1 - 50 µm)

**Preferences associated with criteria**

☒ allow the ranking of packagings with unknown values for mandatory criteria

	enlarge min	min	max	enlarge max	mandatory	optional
O <sub>2</sub> permeance	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>
CO <sub>2</sub> permeance	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>
Temperature	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>
Biodegradability	<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>
Transparency	transparent translucent opaque	<input type="button" value="←"/> <input type="button" value="→"/> <input type="button" value="↔"/>	<input type="text"/>		<input type="checkbox"/>	<input type="checkbox"/>

# ECOBIOCAP *A Decision Support System ...*

Fill in the data required for packaging geometry then run the simulation

EcoBioCap - Optimize permeabilities

**Food properties**

Endive

Mass (kg): 0.5

Shelf life (day): 7

Temperature (°C):

Optimal atmosphere value:

O2 (%): 5

CO2 (%): 4

Respiration properties:

RRO2 max (mmole/kg/h): 1.1833729665147

RQ (RRCO2 / RRO2): 0.74

KmO2 (Pa): 9260

KmCO2 (Pa): 1000000

**Packaging geometry**

Surface (cm²): 600

Volume (l): 1

run simulation

clear

Permeance O2 (mol.m-2.s-1.Pa-1) 5.777244e-11

Permeance CO2 (mol.m-2.s-1.Pa-1) 1.792195e-10

Permeability O2 (mol.m-1.s-1.Pa-1 - 50 µm) 2.888622e-15

Permeability CO2 (mol.m-1.s-1.Pa-1 - 50 µm) 8.960976e-15

**Preferences associated with criteria**

☒ allow the ranking of packagings with unknown values for mandatory criteria

	enlarge min	min	max	enlarge max	mandatory	optional
O2 permeance	4.044071e-11	5.19952e-11	6.354968e-11	7.510417e-11	<input checked="" type="checkbox"/> 1	<input type="checkbox"/>
CO2 permeance	1.254537e-10	1.612976e-10	1.971415e-10	2.329854e-10	<input checked="" type="checkbox"/> 1	<input type="checkbox"/>
Temperature	14	18	22	26	<input checked="" type="checkbox"/> 1	<input type="checkbox"/>
Biodegradability	<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>
Transparency	transparent translucent opaque				<input type="checkbox"/>	<input type="checkbox"/>

rank packagings

# ECOBIOCAP *A Decision Support System ...*

Building of the multi-criteria request ...

**Food properties**

Endive

Mass (kg): 0.5

Shelf life (day): 7

Temperature (°C):

Optimal atmosphere value:

O2 (%): 5

CO2 (%): 4

Respiration properties:

RRO2 max (mmole/kg/h): 1.1833729665147

RQ (RRCO2 / RRO2): 0.74

KmO2 (Pa): 9260

KRCO2 (Pa): 1.8888888888888888

**Packaging geometry**

Surface (cm²): 600

Volume (l): 1

run simulation

clear

Permeance O2 (mol.m-2.s-1.Pa-1) 5.777244e-11

Permeance CO2 (mol.m-2.s-1.Pa-1) 1.792195e-10

Permeability O2 (mol.m-1.s-1.Pa-1 - 50 µm) 2.888622e-15

Permeability CO2 (mol.m-1.s-1.Pa-1 - 50 µm) 8.960976e-15

**Preferences associated with criteria**

☒ allow the ranking of packagings with unknown values for mandatory criteria

	enlarge min	min	max	enlarge max	mandatory	optional
O2 permeance	4.044071e-11	5.19932e-11	6.354968e-11	7.510417e-11	<input checked="" type="checkbox"/> 1	<input type="checkbox"/>
CO2 permeance	1.254537e-10	1.612976e-10	1.971415e-10	2.329854e-10	<input checked="" type="checkbox"/> 1	<input type="checkbox"/>
Temperature	14	18	22	26	<input checked="" type="checkbox"/> 1	<input type="checkbox"/>
Biodegradability	<input checked="" type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>
Transparency	<div>transparent</div> <div>opaque</div>				<div>translucent</div>	<input type="checkbox"/>

rank packagings

**Preferences associated with criteria**

☒ allow the ranking of packagings with unknown values for mandatory criteria

	enlarge min	min	max	enlarge max	mandatory	optional
O2 permeance	<input type="text" value="4.044071e-11"/>	<input type="text" value="5.19952e-11"/>	<input type="text" value="6.354968e-11"/>	<input type="text" value="7.510417e-11"/>	<input checked="" type="checkbox"/> <input type="text" value="1"/>	<input type="checkbox"/> <input type="text"/>
CO2 permeance	<input type="text" value="1.254537e-10"/>	<input type="text" value="1.612976e-10"/>	<input type="text" value="1.971415e-10"/>	<input type="text" value="2.329854e-10"/>	<input checked="" type="checkbox"/> <input type="text" value="1"/>	<input type="checkbox"/> <input type="text"/>
Temperature	<input type="text" value="14"/>	<input type="text" value="18"/>	<input type="text" value="22"/>	<input type="text" value="26"/>	<input checked="" type="checkbox"/> <input type="text" value="1"/>	<input type="checkbox"/> <input type="text"/>
Biodegradability	<input checked="" type="checkbox"/>				<input type="checkbox"/> <input type="text"/>	<input type="checkbox"/> <input type="text"/>
Transparency	<input type="text" value="transparent"/> <input type="text" value="opaque"/>		<input type="text" value="translucent"/> <input type="text"/>		<input type="checkbox"/> <input type="text"/>	<input type="checkbox"/> <input type="text"/>



# Importance of input parameters and databases

## Oxygen and Carbon Dioxide Permeability of Wheat Gluten Film: Effect of Relative Humidity and Temperature

H. Mujica-Paz and N. Gontard\*

ENSIA/CIRAD, B.P. 5098, 1101 avenue Agropolis, 34033 Montpellier Cedex 01, France

**Table 2. Central Composite Design Arrangement and Responses**

variable levels		responses		
$T$ (°C)	RH (%)	CO <sub>2</sub> permeability ( $\text{amol s}^{-1} \text{m}^{-1} \text{Pa}^{-1}$ )	O <sub>2</sub> permeability ( $\text{amol s}^{-1} \text{m}^{-1} \text{Pa}^{-1}$ )	select- ivity
9	14.6	258	111	2.3
39	14.6	314	131	2.4
9	85.3	11475	1011	11.3
39	85.3	22353	863	25.9
3	50	317	181	1.7
45	50	1026	233	4.4
24	0	88	77	1.1
24	100	55580	1970	28.2
24	50	536	159	3.3
24	50	545	152	3.5

# Importance of input parameters and databases

A	E	F	G	H	I	J	K	L	M	N	O	P
REFERENCE	COMMERCIAL NAME or NAME	MATERIAL TYPE	Applicati on	O2 permeability		O2 perm unit	O2 perm RH		RH unit	O2 perm Temperat ure		Temperatur e unit
				min	max		min	max		min	max	
BASF The Chemical Company	Ecoflex FBX 7011	Aliphatic-aromatic copolyester based on the monomers 1, 4 butanediol, adipic acid, terephthalic acid for film extrusion		1400	1400	cm3/(m2.d.bar)	0	0	%	23	23	°C
BASF The Chemical Company	Ecovio LBX 8180	Product containing renewable resources, is basically a compound of our biodegradable copolyester Ecoflex FBX 7011 and polylactic acid (PLA)		30	30	cm3/(m2.d.bar)	0	0	%	23	23	°C
Sanchez-Garcia et al 2008	PHB blend	PHB/PCL, 80:20 wt/wt		4.1995E-19	4.2005E-19	m3.m/(m2.s.Pa)	0	0	%	24	24	°C
Sanchez-Garcia et al 2008	PHB blend	PHB/PCL, 80:20 wt/wt		5.196E-19	5.204E-19	m3.m/(m2.s.Pa)	80	80	%	24	24	°C
Sanchez-Garcia et al 2008	NanoterPHB-Blend	1% of wt (Nanoter™ 2212) based on Kaolinite in PHB blend (PHB/PCL, 80:20 wt/wt)		3.5E-19	4.1E-19	m3.m/(m2.s.Pa)	0	0	%	24	24	°C
Sanchez-Garcia et al 2008	NanoterPHB-Blend	1% of wt (Nanoter™ 2212) based on Kaolinite in PHB blend (PHB/PCL, 80:20 wt/wt)		3.8E-19	4E-19	m3.m/(m2.s.Pa)	80	80	%	24	24	°C
Sanchez-Garcia et al 2008	NanoterPHB-Blend	4% of wt (Nanoter™ 2212) based on Kaolinite in PHB blend (PHB/PCL, 80:20 wt/wt)		2.1E-19	2.7E-19	m3.m/(m2.s.Pa)	0	0	%	24	24	°C
Sanchez-Garcia et al 2008	NanoterPHB-Blend	4% of wt (Nanoter™ 2212) based on Kaolinite in PHB blend (PHB/PCL, 80:20 wt/wt)		2.6E-19	3E-19	m3.m/(m2.s.Pa)	80	80	%	24	24	°C
Sanchez-Garcia et al 2008	PHB	Material with density 1,25 g/cm³ is a meti-processable semicrystalline thermoplastic polymer made form renewable carbohydrate feedstocks		2.298E-19	2.302E-19	m3.m/(m2.s.Pa)	0	0	%	24	24	°C
Sanchez-Garcia et al 2008	NanoterPHB	4% of wt (Nanoter™ 2212) based on Kaolinite in PHB		1.5E-19	2.1E-19	m3.m/(m2.s.Pa)	0	0	%	24	24	°C
Sanchez-Garcia et al 2008	P									4	24	°C
Sanchez-Garcia et al 2008	P									4	24	°C
Sanchez-Garcia et al 2008	P									4	24	°C
PropaFresh	P									3	23	°C

@Web

Ontology

Documents

Query

# @Web - a software to capitalise data

The screenshot displays the @Web software interface. On the left is a vertical navigation menu with a list of topics, including 'Gas permeation pro', 'Gas transfer proper', 'Layer-by-layer asse', 'Mechanical propert', 'Metabolix Mvera da', 'Morphology and Ba', 'Nanocomposites fo', 'Oxygen Permeabili', and 'Oxygen and Carbon'. The 'Oxygen and Carbon' item is highlighted with a red underline. Below it, 'Table 2. Central' is also highlighted. The main content area has tabs for 'Ontology', 'Documents', and 'Query', with 'Documents' selected. In the top right corner, there is a 'Logout' button and a 'Mana' button. Below the tabs, a title bar reads 'on about : Oxygen and Carbon Dioxide Permeability of Wheat Gluten Film: Effect of Relative Humidity and Temperatur'. The main section is titled 'Document's general information' and contains two columns of data. The left column lists 'Document's name : Oxygen and Carbon Dioxide Permeability of Wheat Gluten Film: Effect of Relative Humidity and Temperature', 'Topic associate : PackPermeability', 'Ontology associate : MAPOPT', 'Accepted Tables : 2', 'Rejected Tables : 0', and 'Untreated Tables : 0'. The right column lists 'Authors : H. Mujica-Paz and N. Gontard', 'Journal : J.Agric.FoodChem.', 'Year : 1997', 'Volume : 45', 'Issue : none', and 'URL : none'. A 'Download PDF File' button is located below the URL. At the bottom of the main section, there is a 'Table Management' button. The bottom of the interface features a dark blue bar with the text 'Document's criteria values' and a circular icon on the right.

Valer

Logout

Mana

on about : Oxygen and Carbon Dioxide Permeability of Wheat Gluten Film: Effect of Relative Humidity and Temperatur

Document's general information

Document's name :  
Oxygen and Carbon Dioxide Permeability of Wheat  
Gluten Film: Effect of Relative Humidity and  
Temperature

Authors : H. Mujica-Paz and N. Gontard

Journal : J.Agric.FoodChem.

Year : 1997

Volume : 45

Issue : none

URL : none

Download PDF File

Topic associate : PackPermeability

Ontology associate : MAPOPT

Accepted Tables : 2

Rejected Tables : 0

Untreated Tables : 0

Table Management

Document's criteria values

# CAPITALISATION

**Table 2. Central Composite Design Arrangement and Responses**

variable levels		responses		
T (°C)	RH (%)	CO <sub>2</sub> permeability (amol s <sup>-1</sup> m <sup>-1</sup> Pa <sup>-1</sup> )	O <sub>2</sub> permeability (amol s <sup>-1</sup> m <sup>-1</sup> Pa <sup>-1</sup> )	selectivity
9	14.6	258	111	2.3
39	14.6	314	131	2.4
9	85.3	11475	1011	11.3
39	85.3	22353	863	25.9
3	50	317	181	1.7
45	50	1026	233	4.4
24	0	88	77	1.1
24	100	55580	1970	28.2
24	50	536	159	3.3
24	50	545	152	3.5

Original table

Annotated table

n°	O <sub>2</sub> Permeability Unit : mol/m/s/Pa	Partial pressure difference Unit : %	Packaging	Relative_Humidity Unit : %	Temp Unit :
1	1.110e-16	[ 0.000e+0 ; 1.000e+2 ]	Wheat gluten (20% glycerol - casting)	1.460e+1	9.000e+1
2	1.310e-16	[ 0.000e+0 ; 1.000e+2 ]	Wheat gluten (20% glycerol - casting)	1.460e+1	3.900e+1
3	1.011e-15	[ 0.000e+0 ; 1.000e+2 ]	Wheat gluten (20% glycerol - casting)	8.530e+1	9.000e+1
4	8.630e-16	[ 0.000e+0 ; 1.000e+2 ]	Wheat gluten (20% glycerol - casting)	8.530e+1	3.900e+1
5	1.810e-16	[ 0.000e+0 ; 1.000e+2 ]	Wheat gluten (20% glycerol - casting)	5.000e+1	3.000e+1
6	2.330e-16	[ 0.000e+0 ; 1.000e+2 ]	Wheat gluten (20% glycerol - casting)	5.000e+1	4.500e+1
7	7.700e-17	[ 0.000e+0 ; 1.000e+2 ]	Wheat gluten (20% glycerol - casting)	0.000e+0	2.400e+1
8	1.907e-14	[ 0.000e+0 ; 1.000e+2 ]	Wheat gluten (20% glycerol - casting)	1.000e+2	2.400e+1
9	1.590e-16	[ 0.000e+0 ; 1.000e+2 ]	Wheat gluten (20% glycerol - casting)	5.000e+1	2.400e+1
10	1.520e-16	[ 0.000e+0 ; 1.000e+2 ]	Wheat gluten (20% glycerol - casting)	5.000e+1	2.400e+1



- Effect of plasticizer:
- Evaluation of a Bio-
- Fully Aliphatic Copo
- Gas permeation pro
- Gas transfer proper
- Layer-by-layer asse
- Mechanical propert
- Metabolix Mvera da
- Morphology and Ba
- Nanocomposites fo
- Oxygen Permeabili
- Oxygen and Carbon
- Table 2. Central
- Table 2; CO2 per
- Oxygen barrier of n
- Poly(lactic acid) Na

Information about : Table 2. Central Composite

**Table's name :**

Table 2. Central Composite Design Arrangement and Responses

**Document :**

Oxygen and Carbon Dioxide Permeability of Wheat Gluten Film: Effect of Relative Humidity and Temperature

**Status :**

annotated

**PermaLink :**

EXPORT DE  
DONNEES

1	Document,"Oxygen and Carbon Dioxide Permeability of Wheat Gluten Film: Effect
2	Table," Table 2. Central Composite Design Arrangement and Responses"
3	
4	Year,"Journal","Authors","Volume","Issue","User"
5	1997,"J.Agric.FoodChem.,"H. Mujica-Paz and N. Gontard","45","", "null null"
6	
7	relation,"O2 Permeability_relation"
8	
9	type Relative_Humidity,"Val 1 Relative_Humidity","Val 2 Relative_Humidity","uni
0	scalar,"1.460e+1","1.460e+1","%", "scalar","9.000e+0","9.000e+0","Â°C","interva
1	scalar,"1.460e+1","1.460e+1","%", "scalar","3.900e+1","3.900e+1","Â°C","interva
2	scalar,"8.530e+1","8.530e+1","%", "scalar","9.000e+0","9.000e+0","Â°C","interva
3	scalar,"8.530e+1","8.530e+1","%", "scalar","3.900e+1","3.900e+1","Â°C","interva
4	scalar,"5.000e+1","5.000e+1","%", "scalar","3.000e+0","3.000e+0","Â°C","interva
5	scalar,"5.000e+1","5.000e+1","%", "scalar","4.500e+1","4.500e+1","Â°C","interva
6	scalar,"0.000e+0","0.000e+0","%", "scalar","2.400e+1","2.400e+1","Â°C","interva
7	scalar,"1.000e+2","1.000e+2","%", "scalar","2.400e+1","2.400e+1","Â°C","interva
8	scalar,"5.000e+1","5.000e+1","%", "scalar","2.400e+1","2.400e+1","Â°C","interva
9	scalar,"5.000e+1","5.000e+1","%", "scalar","2.400e+1","2.400e+1","Â°C","interva
0	
1	
2	
3	

O2 Permeability Unit : mol/m/s/Pa	Partial pressure difference Unit : %
1.110e-16	[ 0.000e+0 ; 1.000e+2 ]
1.310e-16	[ 0.000e+0 ; 1.000e+2 ]
1.011e-15	[ 0.000e+0 ; 1.000e+2 ]
8.630e-16	[ 0.000e+0 ; 1.000e+2 ]
1.810e-16	[ 0.000e+0 ; 1.000e+2 ]
2.330e-16	[ 0.000e+0 ; 1.000e+2 ]
7.700e-17	[ 0.000e+0 ; 1.000e+2 ]
1.907e-14	[ 0.000e+0 ; 1.000e+2 ]
1.590e-16	[ 0.000e+0 ; 1.000e+2 ]
1.520e-16	[ 0.000e+0 ; 1.000e+2 ]

Wheat gluten (20% glycerol - casting)	5.000e+1
---------------------------------------	----------

# QUERY

@Web

Ontology

Documents

Query

Valerie ▼

## Query

- ✓ Define Scope
- ✗ Define Value domains
- ✗ Define Parameters
- Check and Run Query
- Delete Query

## Export

## Query Scope Summary

### Selected Ontology

MAPOPT

### Selected Topics

"PackPermeability", "MapOptTopic", "MapOpt\_demo"

### Selected Relations

CO2 Permeability\_Relation

Please note : removing query scope leads to removing all query definition entries including preferences and global parameters.

remove query scope

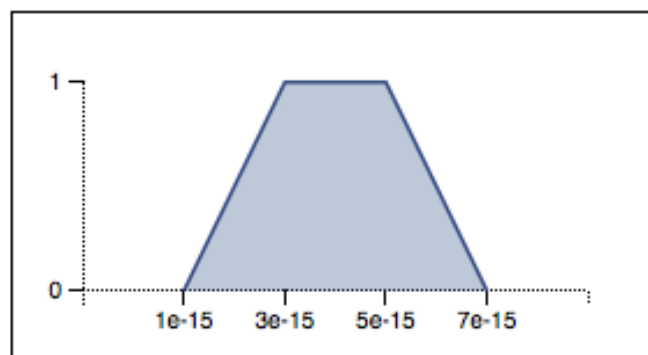
## Define domain values for attribute CO2 Permeability



### Define numeric value domain

#### Select unit

Mole per Meter per second per pascal ▼



best values

min max

1e-15

3e-15

5e-15

7e-15

min

max

acceptable values

Are values...

mandatory ? ☐ desirable ? ☐

save

Cancel

# QUERY: RESULTS

## Query Results (2)

Ontology: MAPOPT - Topics: PackPermeability , MapOptTopic , MapOpt\_demo  
Relation: CO2 Permeability\_Relation

☒ Mandatory ☐ Desirable

rank	reliability score	CO2 Permeability [ 1.000e-15 ; 3.000e-15 ; 5.000e-15;7.000e-15 ] , mol/m/s/Pa	Temperature	Thickness	Relative Humidity	Partial pressure difference	Packaging
row 1_2607							
1		[ 1.840e-15 ] , mol/m/s/Pa	[ 2.000e+01 ] , °C	[ 6.950e+01 ; 7.750e+01 ] , µm	[ 7.000e+01 ] , %	[ 1.000e+02 ] , %	[ Wheat gluten/paper ]
row 5_160							
2		[ 1.026e-15 ] , mol/m/s/Pa	[ 4.500e+01 ] , °C	[ 7.700e+01 ; 8.300e+01 ] , µm	[ 5.000e+01 ] , %	-	[ Proteins ]



# RELIABILITY/FIABILITE

## Document's criteria values



### Criterion repetition

Experience Repetition : yes

### Criterion number of repetitions

Number of repetitions : unknown

### Criterion age and citation number

Citation Number : more than 40

Age : more than 8 years old

### Criterion age and top citation

## Reliability evaluation's document information



### Reliability results



Low expectation : 4.87 ; High expectation : 5.0

Known criteria values rate : 60 %

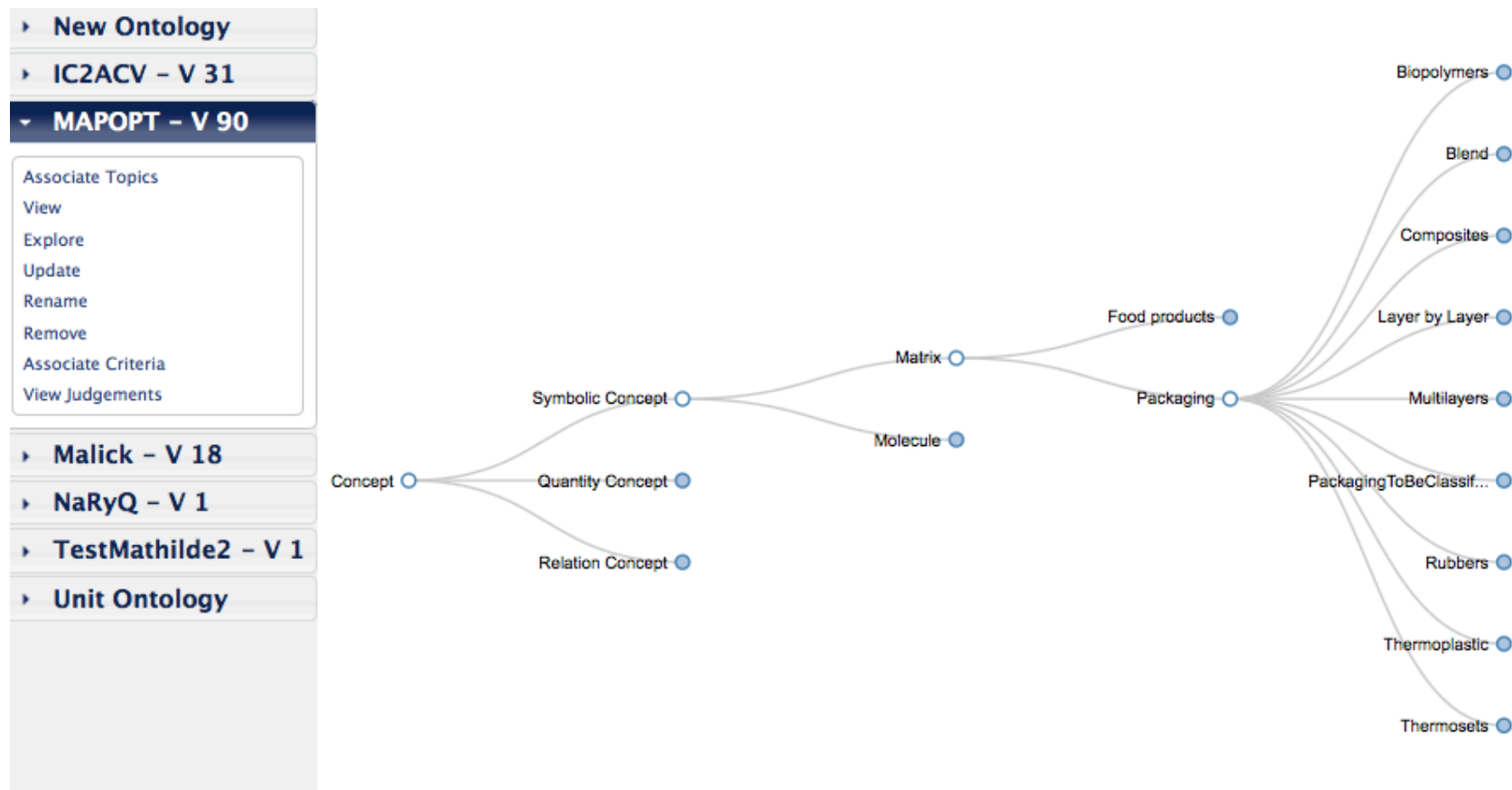
**Last evaluation date :** 2014-11-17

## @Web - un retour sur utilisation

- Utilisateur confirmé → un article 1 à 2 h
  - En pratique: capitalisation d'un article / semaine
  - Mobilisation de l'équipe entière/pHD et post-docs
  - Réseau?
  - Possibilité d'importer directement les bases de données excel existantes?
- Query //5 à 10 min
  - Construction (3 étapes) +interrogation (30' à 1 min) + export des données si besoin

## @Web - un retour sur utilisation

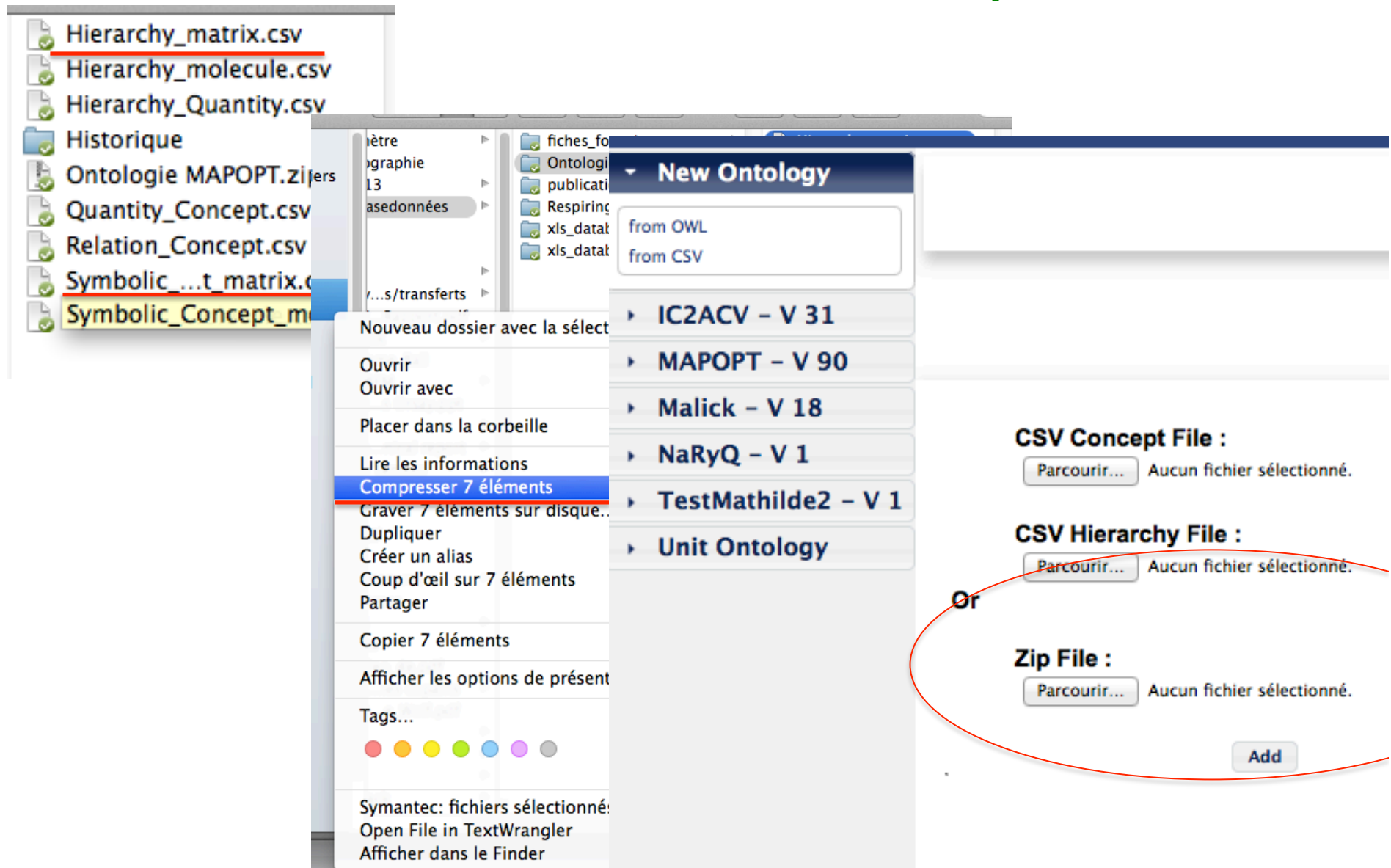
- Utilisateur confirmé → un article 1 à 2 h



# Modification de L'ontologie

Hierarchy_matrix.csv	
Hierarchy_molecule.csv	
Hierarchy_Quantity.csv	
Historique	
Ontologie MAOPT.zip	
Quantity_Concept.csv	
Relation_Concept	39 (5wt%/cellulose nanocrystals/(1wt%/Ag/Poly(lactic acid) ; (5wt%/CNC/(1wt%/Ag/PLA) ; ; ;
Symbolic_Concept	40 "(5wt%)Modified cellulose nanocrystals/(1wt%)Ag/Poly(lactic acid)";(5wt%)s-CNC/(1wt%)Ag/PLA"; ; ; ;
	41 "(6.9wt) Dimethylbis(hydrogenated-tallow) ammonium montmorillonite (13.1wt%) Maleic anhydride grafted poly
	42 "(6wt) wheat straw fibers/Poly(3-hydroxybutyrate-co-3-hydroxyvalerate)";(6wt) wheat straw fibers/PHBV"; ; ; ;
	43 "(60wt%) Soy protein isolate/ (40wt%) Poly(lactic acid)"; ; ; ;
	44 "(5%)Cloisite Na+/Poly(lactic acid)"; ; ; ;
	45 "(5%)Cloisite 30B/Poly(lactic acid)"; ; ; ;
	46 "(5%)Cloisite 20A/Poly(lactic acid)"; ; ; ;
	47 "(1wt%)Cloisite 30B/PLA(4060D)"; ; ; ;
	48 "(1wt%)Cloisite 30B/PLA(4032D)"; ; ; ;
	49 "(2wt%)Cloisite 30B/PLA(4060D)"; ; ; ;
	50 "(2wt%)Cloisite 30B/PLA(4032D)"; ; ; ;
	51 "(3wt%)Cloisite 30B/PLA(4060D)"; ; ; ;
	52 "(3wt%)Cloisite 30B/PLA(4032D)"; ; ; ;
	53 "(4wt%)Cloisite 30B/PLA(4060D)"; ; ; ;
	54 "(4wt%)Cloisite 30B/PLA(4032D)"; ; ; ;
	55 "(5wt%)Cloisite 30B/PLA(4060D)"; ; ; ;
	56 "(5wt%)Cloisite 30B/PLA(4032D)"; ; ; ;
	57 "(6wt%)Cloisite 30B/PLA(4060D)"; ; ; ;
	58 "(6wt%)Cloisite 30B/PLA(4032D)"; ; ; ;
	59 "(Chitosan/Lambda-Carrageenan)20_Poly(ethylene terephthalate)"; ; ; ;
	60 "(Chitosan/Lambda-Carrageenan/Chitosan/Sodium Montmorillonite)10_Poly(ethylene terephthalate)"; ; ; ;
	61 "(Chitosan/Sodium Montmorillonite/Lambda-Carrageenan)10_Poly(ethylene terephthalate)"; ; ; ;
	62 "(Oriented polyamide)/adhesive/polypropylene copolymer"; ; ; ;
	63 "(Polyacrylamide/Sodium Montmorillonite)10- Polyethylene terephthalate"; ; ; ;
	64 "(Polyacrylamide/Sodium Montmorillonite)15- Pde)20- Polyethylene terephthalate"; ; ; ;
	65 "(Polyacrylamide/Sodium Montmorillonite)25- Polyethylene terephthalate"; ; ; ;
	66 "(Polyacrylamide/Sodium Montmorillonite)30- Polyethylene terephthalate"; ; ; ;
	67 "(Polyacrylamide/Sodium Montmorillonite)5- Polyethylene terephthalate"; ; ; ;
	68 "(Polyetylenimine pH7/Montmorillonite)40- Polyethylene terephthalate"; ; ; ;
	69 "(Polyetylenimine pH9/Montmorillonite)40- Polyethylene terephthalate"; ; ; ;

# Modification de L'ontologie



# Unités

[View Unit Ontology](#)

Atmosphere
Bar
Cfu
Day
Degree_Celsius
Degree_Fahrenheit
FPU
Gram
Hour
Inch
Joule
Liter
Meter
Meter_Mercury
Minute
Mole
One
Pascal
Percent

Attomole
Centimeter
Centimeter_Mercury
Decimeter
Femtometer
Hectogram
Hectopascal
KiloWatt
Kilogram
Kilopascal
MegaPascal
Megajoule
Micrometer
Micromole
Millibar
Milligram
Milliinch
Milliliter
Millimeter

[illegible]


SELECTED C

**PrefLabel :**

- Perméabilité à l'oxygène (fr)
- O2 Permeability (en)

**Restriction :**

- $[0; +\infty[$

Unit  :

none

~~cc m-2 24h-1~~

cc m-2 24h-1 bar-1

cc m-2 24h-1 Pa-1

 $\text{cm}^3 \cdot \text{cm} \cdot \text{cm}^{-2} \cdot \text{s}^{-1} \cdot \text{Pa}^{-1}$ 

cm<sup>3</sup> μm m<sup>-2</sup> d<sup>-1</sup> kPa<sup>-1</sup>

cc mil m-2 day-1 atm-1

cm3.m-1.d-1.atm-1

~~cm<sup>3</sup>.m<sup>-1</sup>.d<sup>-1</sup>.kPa<sup>-1</sup>~~~~cm<sup>3</sup>/m/s/Pa~~

# Annotations

Manual Annotation of Table 1. Oxygen Transmission Data for 40-Bilayer Assemblies Made with Clay and PEI at Varying pH Levels

## Original table

permeability ( $\times 10^{-6}$ cc/(m·day·atm))					
40-BL assembly	OTR (cc/(m·day·atm))	film thickness (nm)	film <sup>a</sup>	total	Cussler's $\alpha$ predictions <sup>b</sup>
PEI <sub>7</sub> /MMT	8.42	48.02	48.55	1507.36	

Manual Annotation of Table 2. Central Composite Design Arrangement and Responses

## Original table

## Annotated table

n°	O2 Permeability Unit : mol/m/s/Pa	Partial pressure difference Unit : %	Packaging	Relative_Humidity Unit : %	Temperature Unit : °C	Thickness Unit : μm
1	1.110e-16	[ 0.000e+0 ; 1.000e+2 ]	Wheat gluten (20% glycerol - casting)	1.460e+1	9.000e+0	[ 7.700e+1 ; 8.300e+1 ]
2	1.310e-16	[ 0.000e+0 ; 1.000e+2 ]	Wheat gluten (20% glycerol - casting)	1.460e+1	3.900e+1	[ 7.700e+1 ; 8.300e+1 ]
3	1.011e-15	[ 0.000e+0 ; 1.000e+2 ]	Wheat gluten (20% glycerol - casting)	8.530e+1	9.000e+0	[ 7.700e+1 ; 8.300e+1 ]
4	8.630e-16	[ 0.000e+0 ; 1.000e+2 ]	Wheat gluten (20% glycerol - casting)	8.530e+1	3.900e+1	[ 7.700e+1 ; 8.300e+1 ]
5	1.810e-16	[ 0.000e+0 ; 1.000e+2 ]	Wheat gluten (20% glycerol - casting)	5.000e+1	3.000e+0	[ 7.700e+1 ; 8.300e+1 ]
6	2.220e-16	[ 0.000e+0 ; 1.000e+2 ]	Wheat gluten (20% glycerol - casting)	5.000e+1	4.500e+1	[ 7.700e+1 ; 8.300e+1 ]

## @Web - un retour sur utilisation

- Pouvoir ajouter un nom de concept directement lors de la saisie // sans intervenir sur les fichiers .csv
- Automatiser l'import de tableau excel
- Automatiser l'import de tableau html?
- Comment faire vivre l'outil?
  - Au delà des développements méthodo
  - Quel communauté? (académique uniquement?)
  - Quel support?