LIFE13 ENV/IT/000470 "ECODEATTING"
Environmentally friendly natural products instead of chemical products in the degreasing phase of the tanning cycle

Action C2, C3 and C4
Environmental monitoring of defatting with natural products at laboratory, semi- and pre-industrial level.

Duration
01.10.2014 to 30.09.2016

Total Budget
€ 1,035,556.00

EU contribution
€ 517,778.00

Beneficiary responsible for implementation: Inescop, Iccom, Newport and Unifi

The metal content of supposedly metal free products involved in the Ecodefatting project was determined by Inductively Coupled Plasma Optical Emission Spectrometry (ICP-OES) (Optima-8000, Perkin Elmer) and in the case of Hg with a direct analyzer (DMA-80, Milestone, Italy). Pleasingly, both effluents from action B.1, B.2 and B.3 of the project and the products used to formulate the new defatting agents were essentially free from heavy metals. Occasionally, relatively high amounts of Al and Fe were found, that were consistently expected from the work operations inside tannery premises. In any case, the values found were well below the thresholds required by law and in some cases they were even below the detection limit of the instrument.

The Equipment

ICP-OES, Optima-8000

Direct analyzer, DMA-80

Commercial products

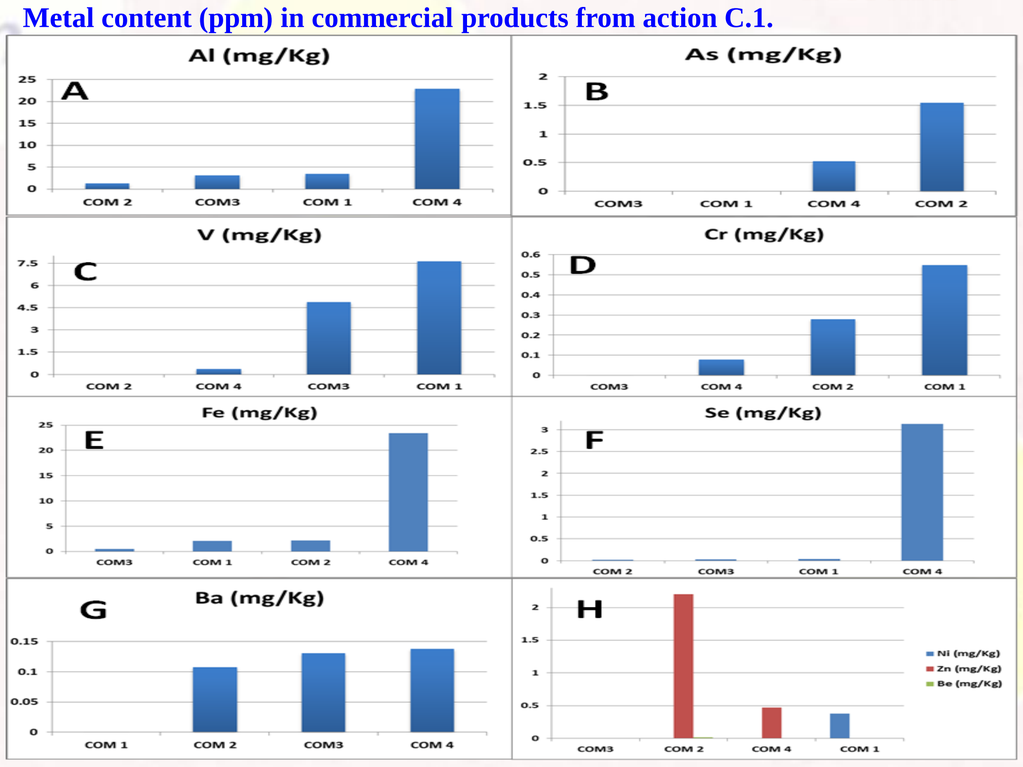
Ethoxylated Alcohols

Castor oils

Cosolvents

Results

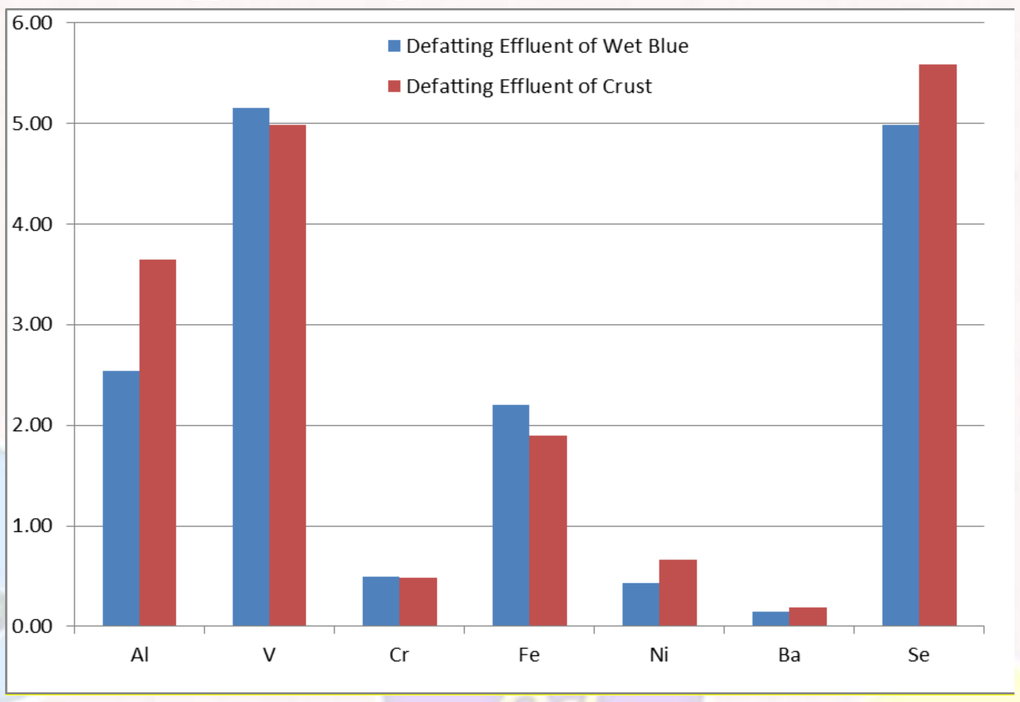
Metal content (ppm) in commercial products from action C.1.



Metal content (ppm) in commercial products for EDF formulations.

Metal	Rokanol 5mEO	Castor oil 40 mEO	Etocas 15 mEO	Tripropionin	Natural product	Hexyene glycol
Al	-	2.75	0.20	1.03	-	0.96
As	-	-	-	-	-	-
B	3.46	11.7	6.06	4.65	4.51	5.73
Ba	0.12	-	-	0.05	0.19	-
Be	-	-	-	-	-	-
Cd	-	-	-	0.08	-	-
Co	-	-	-	-	-	-
Cr	-	0.07	-	-	0.02	-
Cu	-	-	-	-	-	-
Fe	-	0.58	0.26	0.27	2.03	0.37
Mn	-	-	-	-	-	-
Ni	-	-	-	-	0.67	-
Pb	-	1.24	-	-	-	-
Sb	-	-	-	-	-	-
Se	5.88	6.02	2.64	4.13	5.59	7.16
Tl	-	-	-	-	-	-
V	3.46	11.7	6.06	4.65	4.51	5.73
Zn	-	-	-	-	-	-

Metal content (ppm) in defatting effluents from action C.3.



Metal content (ppm) in defatting effluents from action C.2

Metal	EDF8	EDF15	EDF20	EDF22
Al	0.198	3.45	4.08	2.75
As	-	-	-	-
B	-	-	-	-
Ba	0.13	0.19	-	0.05
Be	-	-	-	-
Cd	-	-	-	0.08
Co	-	-	-	-
Cr	0.548	-	0.309	-
Cu	-	-	-	-
Fe	2.12	0.27	1.05	0.26
Mn	-	-	0.817	-
Ni	-	0.665	0.157	-
Pb	-	-	0.01	-
Sb	-	-	-	-
Se	0.03	5.59	0.01	4.13
Tl	-	-	-	-
V	7.64	4.65	14.0	6.06
Zn	-	-	-	-

Hg in commercial products for EDFs.

Sample	Hg (µg/Kg)	Sample	Hg (µg/Kg)
CASTOR OIL 25	0.05	TRIETHYL CITRATE	0.05
ETOCAS 15	0.09	ETOCAS 29	0.05
ROKANOL	0.201	CASTOR OIL 40	0.05
HEXYLENE GLYCOL	0.219	SORBITAN	0.05
TRIPIOPIONIN	0.221	POLOCHEM 150 5M	0.05
POLOCHEM 150 3M	0.085		

Hg in effluents from action C.2.

Sheep skins defatted	Hg (µg/Kg)
EDF8	0.065
EDF15	0.05
EDF20	0.051
EDF22	0.043

Hg in effluents from action C.3.

Sheep skins defatted with EDF20	Hg (µg/Kg)
Wet Blue	0.06
Crust	0.05

Coordinating beneficiary

Chemical Department "Ugo Schiff" Florence University (IT)

Associated beneficiaries

Chemical Institute of organometallic compounds of CNR (IT)

Newport Srl (IT)

Asociación de Investigación para la industria del calzado (ES)

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