



Participating organisation

Spain



Universidad Complutense de Madrid

Departamento de Ingeniería Química

Facultad de Química

Avda. Complutense, s/n

28040 Madrid

Complutense University of Madrid

Department of Chemical Engineering

Faculty of Chemistry

Avda. Complutense, s/n

28040 Madrid

ablanco@quim.ucm.es



Organisation's details

Spain



Complutense University of Madrid Chemical Engineering Department Cellulose and Paper Research Group

Services/Products:	Public Institution for education, training and research
Total number of employees:	9000 (14)
Employees in E48 related areas:	6
Number of students:	~ 100 000 (8 PhD students)
Research focus:	<ul style="list-style-type: none">•Paper recyclability•Wet-end chemistry•Closure of water circuits•Water treatment•Process optimization
Ownership structure:	State owned



E48 representative's presentation (I)

Angeles Blanco

Professor
Departament of Chemical Engineering
Faculty of Chemistry
Avda. Complutense, s/n
28040 Madrid (Spain)
ablanco@quim.ucm.es
Tel.: +34 91 394 42 47

Academic background:

- **Bachelor of Chemistry Sciences (UCM Madrid, 1991)**
- **PhD in Industrial Chemistry (UCM Madrid, 1994)**
- **Assistant Professor (UCM Madrid, 1991-1996)**
- **Associated professor (UCM Madrid, 1996-2002)**
- **Professor (UCM Madrid, from 2002)**

Areas of expertise:

- **Stock preparation**
- **Wet-end chemistry**
- **Closure of water systems**
- **Environmental technologies**

Spain



Function in COST E48:
Leader of WG 1



E48 representative's presentation (II)

Spain



Most relevant publications in the field of E48:

C. Negro, A. Blanco, M.C. Monte, D. Otero and J. Tijero
"Depositability character of disturbance substances"
Published in Paper Technology, 1999

A. Blanco, C. Negro, M.C. Monte, D. Otero and J. Tijero.
"New system to predict deposits due to DCM destabilization in paper mills"
Published in Pulp and Paper Canada, 2000

A. Blanco, C. Negro, M. C. Monte, D. Otero and J. Tijero.
"Destabilisation of dissolved and colloidal material derived from coated paper"
Published in Appita J., 2001

Blanco A., Negro C., Monte M.C. and Tijero J.
"The challenges of sustainable papermaking"
Published in Environmental Science and Technology, 2004



Own expectations in E48

Spain



- **Gain knowledge on:**
 - Evaluation of the characteristics of the future recovered paper.
 - Influence of future recovered paper on the processing and quality of the final product.
 - The prediction of modifications in the manufacturing processes to be adapted to the quality of future recovered paper.
 - Design of recycling-friendly paper products.
 - More effective strategies for collection of used paper products.
- **Exchange of information about challenges in the future paper recycling.**
- **Networking.**
- **Increase mobility of researchers (especially Ph.D. students).**



Own contributions to E48

Spain



Finished or current projects in the area of E48:

- Project 1: “Characterization and control of colloids in paper mills recycling wastepaper” (COLLOIDS)
- Project 2: "Eco-efficient novel enzymatic concepts for slime control in pulp and paper processing" (SLIMEZYMES)
- Project 3: "Reduction of detrimental substances in papermaking" (RODET)
- Project 4: “Caracterización y control de la materia detrimental en la fabricación de papel reciclado” (DETRI-RECICLA)

Projects submitted or planned during the duration of E48

- “Advanced quality prediction tool for knowledge driven packaging design and manufacturing in European SMEs” (MODELPACK)
- “Development of analytical methods and tools for the evaluation of recycled fibre content in paper products, in support of the strategic evolution of the European paper value chain” (EVAREC)

Specific tools (equipment/software) relevant for E48 objectives

- Deposition rotor
- Methodology to quantify DCM based on FBRM data
- Development of soft sensors



Brief description of own finished or ongoing research projects in the area

Spain



Project 1: “Characterization and control of colloids in paper mills recycling wastepaper” (COLLOIDS)

- **Background:** Due to trends in papermaking like closed water systems or higher use of recovered paper as raw material, a large number of contaminants are accumulated in the system as dissolved and colloidal material (DCM). When the DCM is destabilized by a sudden change in the system conditions, it produces sticky deposits called secondary stickies that affect the papermaking processes and the quality of the final product.
- **Objectives:** To know the origin of the DCM in order to reduce the sources and to control the DCM by the selection of the raw materials and the application of removal techniques.
- **Means:** Development of a methodology to characterize the colloidal substances present in waters. Development of removal techniques: filtration, electroflotation, dissolved air flotation. Development of new additives.
- **Results (so far):** Two new additives were developed. The microflotation combined with membrane filtration was the most promising removal technique. High efficiency removal of DCM.



Brief description of own finished or ongoing research projects in the area

Spain



Project 2: "Eco-efficient novel enzymatic concepts for slime control in pulp and paper processing" (SLIMEZYMES)

- **Background:** The main trends in the paper industry include an increase in the use of recovered paper of lower quality, the closure of the water circuits and production in alkaline or neutral media. All these trends have a negative effect on the microbiological related problems and, consequently, on the treatment programs. One of the problems related to microbiological growth is the slime production.
- **Objectives:** To develop new strategies based on enzymes to control slime in papermaking. The combined use of the enzymes with other control agents for slime as dispersants allow the substitution of the biocides potentially toxic use in the present.
- **Means:** Development of laboratory equipment to produce slime in controlled conditions. Development of techniques to monitor/control slime growth. Development of new enzymes to degrade the polysaccharides that form the slime.
- **Results (so far):** The enzymatic control of slime seem to be a clean and sustainable technology. A new enzyme treatment has been developed with high efficiency.



Brief description of own finished or ongoing research projects in the area

Spain



Project 3: "Reduction of detrimental substances in papermaking" (RODET)

- **Background:** Closed water systems and higher use of recovered paper as raw material provoke the accumulation of a large number of detrimental substances for papermaking. These detrimental substances affect both the papermaking processes and the quality of the final product, reducing the productivity of the mills.
- **Objectives:** To improve the papermaking process and the increase of the grade of the closed water systems by the removal, neutralization or masking of detrimental substances from recovered paper.
- **Means:** Development of new additives (modified talcs, bentonites and aluminium salts with organic polymers). The efficiency of these additives is evaluated by different methods (dissolved air flotation, deposition tester and fixation tests).
- **Results (so far):** The additives have shown different behaviours as control agents of DCM (as fixation agents; as "kidney" agents or as passivation agents). Good efficiency has been observed with one of the new chemicals for destabilization and removal of DCM.



Best description of own finished or ongoing research projects in the area

Spain



Project 4: “Caracterización y control de la materia detrimental en la fabricación de papel reciclado” (DETRI-RECICLA)

- **Background:** The use of secondary fibres as raw material in papermaking has many environmental and economic advantages, but also presents disadvantages, due to the contaminants that introduce to the process (detrimental material). One of the main problems is the formation of the adherent deposits (stickies) and inks.
- **Objectives:** To characterize all kind of stickies contained in a pulp suspension. To select the removal and/or control stage of the contaminants. To analyse the behaviour of the deposits respect to the air bubbles and the chemical conditions in a flotation system. To consolidate the flotation stage in the deinking process as an effective stage for the removal of the different kinds of inks.
- **Means:** Development of a methodology to characterize all kind of stickies. Optimization of the flotation system to remove stickies and inks.
- **Results (so far):** The characterization of the stickies and the inks will allow to select the removal and/or control stage of the contaminants and the most adequate treatment for its control/removal by a flotation system.



Organisation of E48 events

Spain



My organisation has the personal and logistic facilities to organise major E48 events and would particularly be prepared to host (please tick box)



specific (seperate) MC or WG meetings



parallel or consecutive meetings of both MC and WGs



a workshop (up to 50 participants)



an international conference (more than 50 participants)



External contributions to E48

Spain



I believe that the following external organisations or experts could make valuable contributions to E48 events:

Name	Organisation	Expertise
	Holmen Paper	Recycling processes
Mahendra Doshi	PPR Editorial	Progress in paper recycling, trends, world situation
Carlos Reinoso	ASPAPPEL	Spanish situation



Expectations and offers concerning STSMs

Spain



My organisation is prepared to host young academics from foreign organisations in the frame of STSMs. We could offer collaboration in

- Analysis of raw materials
- Prediction of paper properties

My organisation is interested in sending young academics to foreign research organisations in the frame of STSMs.

We would particularly be interested in learning more about

- Evaluation of the characteristics of the future recovered paper.
- Influence of future recovered paper on the processing and quality of the final product.
- The prediction of modifications in the manufacturing processes to be adapted to the quality of future recovered paper.