

NATO/CCMS Pilot Study on Clean Products and Processes

How to make Carbochemistry compatible with the Environment

Oviedo, 6-11 May, 2001



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NATO/CCMS Pilot Study on Clean Products and Processes

How to make Carbochemistry
compatible
with the Environment

- Company Presentation.
- Environmental Policy in IQN.
- An example of an industrial, clean process.



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COMPANY BACKGROUND

- **I.Q. NALON,S.A. was founded in 1943.** Since then, the company has undergone a continuous technological and organizational development in the two main Industrial Production Lines:
 - **Distillation of Coal Tar.**
 - **Production of Foundry Coke.**
- The distillation of coal tar was developed concurrently with the establishment and growth of the National Iron and Steel Industry in the region (former ENSIDESA and now ACERALIA/ARBED/USINOR GROUP).
- Since 1992, the technology developed by the company, together with a new purchasing policy based on international suppliers, allowed the company to make a series of strategic investments on the construction of new plants (Continuous Coal Tar Distillation Unit and Hydro-refining Naphthalene Plant), in general services and logistics.
- The strategy of I.Q. Nalón, S.A. In the Coal Tar Distillation is:
 - Continuous Growth (consistent with sound profitability and coal tar availability).
 - Development of industrial and logistics projects, both in Spain and abroad.



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LOCATIONS



Warehouse



Tanks



Factory



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Europe



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CAPACITIES

- **COAL TAR DISTILLATION PLANT:**

- Continuous Distillation Plant (Trubia) : 250,000 mt. Coal Tar / year
- Batch Distillation Plant (Trubia) : 120,000 mt. Coal Tar / year

Total name-plate capacity : 370,000 mt. Coal Tar / year

I.Q. Nalón, S.A. is currently one of the most important international producers of Coal Tar Pitch. The company has two separate plants at the Trubia site that share general services and logistics, and have complementary technologies (Tailor-made Pitch production/long production runs) and surplus capacity.

CTP production in 2000 : 130,000 mt.

- **FOUNDRY COKE:**

- Coke Oven Battery (Sama de Langreo) : **125,000 mt. Coke / year**

I.Q. Nalón, S.A. is one of the main producers of high quality coke in Europe.





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CAPACITIES (CONT'D.)

• COAL TAR DISTILLATION:

– UNITS:

- Coal Tar Distillation (2 plants)
- Naphthalene Distillation Plant
- Naphthalene Hydro-Refining Plant
- Naphthalene Flaking / Pellets / Balls
- Naphthalene Crystallization
- Coal Tar Pitch Solidification (2 plants)
- Liquid Coal Tar Pitch
- Centrifugation of Coal Tar

– PORT FACILITIES:

- S.J.Nieva (Spain)
- Szczecin (Poland)
- Marseilles (France)

– STORAGE CAPACITY:

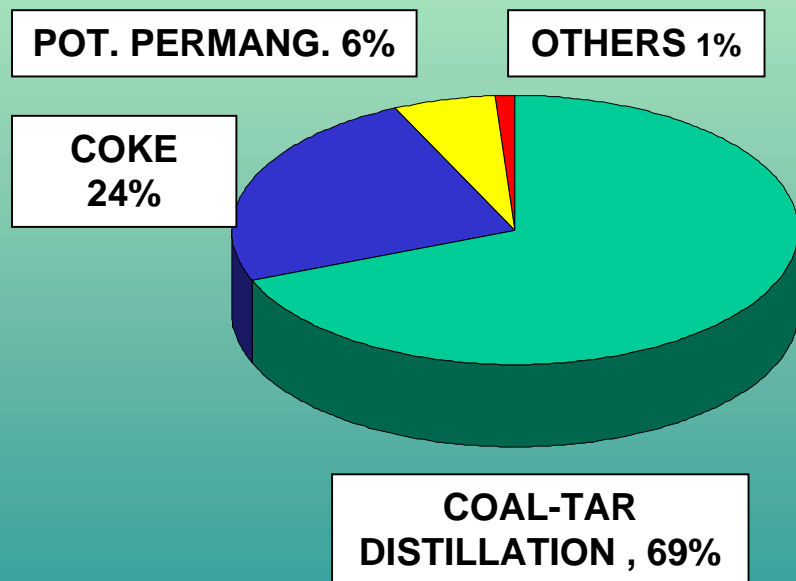
- Liquids in bulk (Tar+ oils)
 - Trubia 30,000 mt. capacity
 - S. J. Nieva 10,000 mt. capacity
- Bulk-solid products 25,000 mt. capacity
- Palletized products 1,500 mt. capacity
- Liquid Coal Tar Pitch
 - Trubia 1,200 mt. capacity
 - S. J. Nieva 1,800 mt. capacity



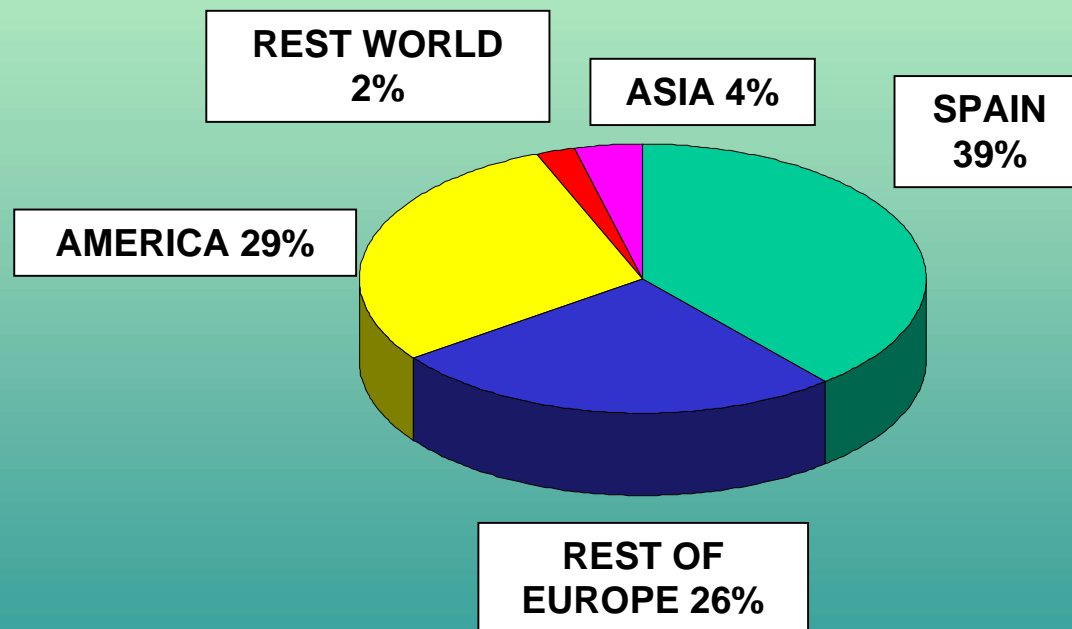
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GENERAL INFORMATION

BREAKDOWN OF BUSINESS BY PRODUCTS



BREAKDOWN OF SALES BY MARKETS





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TECHNOLOGY

- **I.Q.Nalón,S.A., has developed proprietary technology for all its industrial production processes.**
 - This know-how and its transformation into different industrial processes has been the main driving force for the growth and innovation of the company, assuring its international competitiveness and a differential quality in its products and related services.
 - In the distilling operations, I.Q. Nalón,S.A. has incorporated its own technical developments into the following units:
 - Coal Tar Centrifugation.
 - Continuous Coal Tar Distillation
 - Coal Tar Pitch Solidification
 - Naphthalene Distillation
 - Naphthalene Refining
 - Naphthalene Crystallization
 - **I.Q. Nalón,S.A. is probably the only company in its sector which has carried out intensive capital investment in the distillation activity since the 1980's, which have continued and even intensified from 1993 to date.**
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ENVIRONMENTAL POLICY

“In the development of the industrial activity, any behavior that affects the safety and health of our employees, neighbours, customers and the community in general, and the respect for the environment, will be of priority interest in business decisions”.

Environmental Directives in IQN: compliance with legal regulations in force, continuous improvement of processes and products, minimising and anticipating negative environmental effects, rational use of resources, prevention and control of pollution, training of employees, This directives include the participation of IQN’s delegates in International Working Groups on Environmental Issues, such as those organized by the International Tar Association, among others.



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ENVIRONMENTAL POLICY

IQN's Environmental Main Objective in the last decade: "To integrate the respect for the Environment with the Productive Processes and Management of the Company"

This objective has been approached by means of: continuous investment in process improvement (minimising of emissions, use of low-sulfur fuels), developing of new and clean technologies, and recovery and re-utilization of residues.

In our opinion, the main advantages of this policy are: continuous optimization of the processes and, credibility and responsibility with customers and competitors.

Besides, as another result of this policy, IQN has been certified according to ISO14001 standards in 1998. But we think that there is still a long way to go.

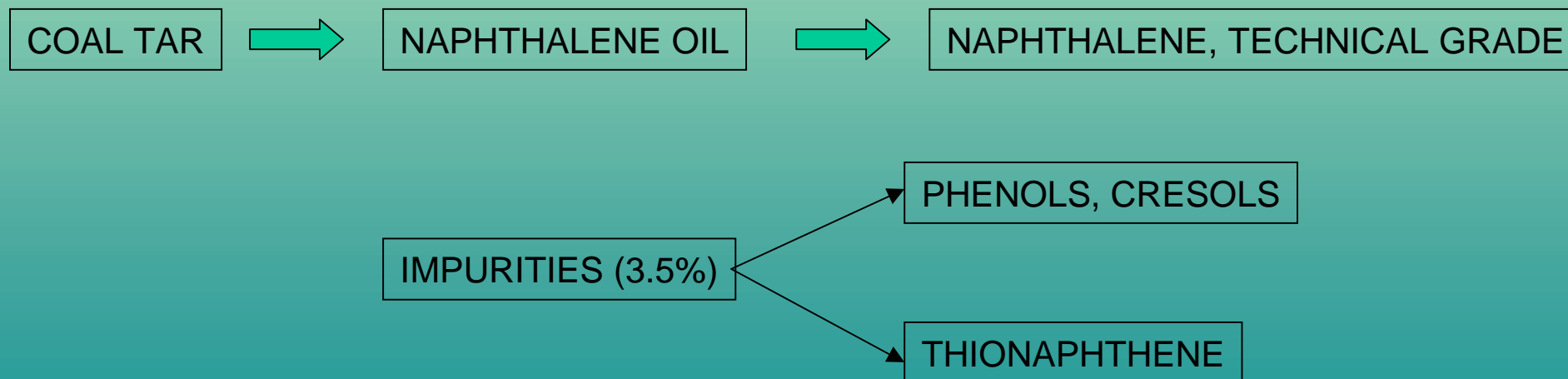


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AN EXAMPLE OF A CLEAN, CARBOCHEMICAL PROCESS: PRODUCTION OF REFINED NAPHTHALENE

Feedstock: Naphthalene, Technical Grade

Process consisting in progressive purification by distillation processes, beginning with coal tar.





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AN EXAMPLE OF A CLEAN, CARBOCHEMICAL PROCESS: PRODUCTION OF REFINED NAPHTHALENE

Traditional Technology for refined naphthalene production:

MULTI-STAGE CRYSTALLIZATION OF N.T.G.

- The higher the quality, the lower the yield in end product.
 - Limitation in maximum quality: no more than 99% purity.
 - Requires several steps.
 - Also obtained fractions with high sulphur content.
 - Only use for this fractions: fuels. SO₂ emissions.
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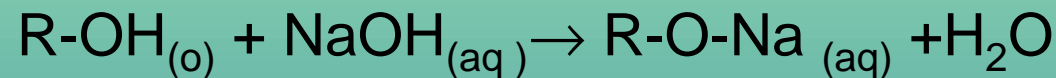
AN EXAMPLE OF A CLEAN, CARBOCHEMICAL PROCESS: PRODUCTION OF REFINED NAPHTHALENE

New Technology for refined naphthalene production:

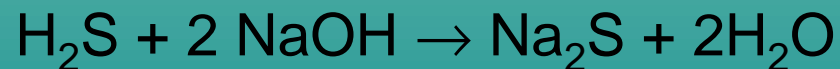
HYDROTREATMENT OF T.G.N.

• This technology includes three steps:

1. Extraction of phenols with sodium hydroxide:



2. Catalytic Hydrotreatment of thionaphthene:



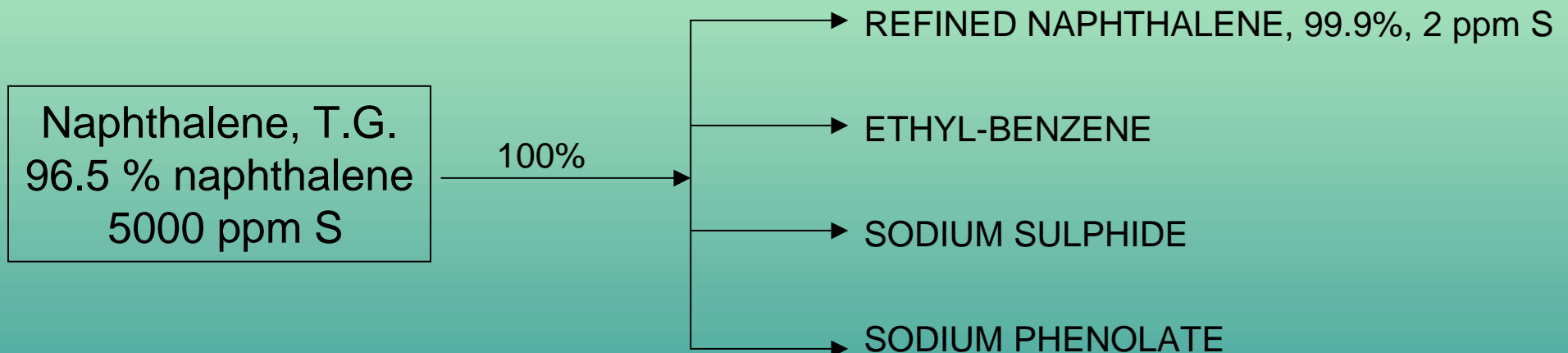
3. Separation of Ethyl-benzene by distillation.



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RESULTS OF THE PROCESS



- **High yield** in refined naphthalene.
- E.B., Na₂S and S.F. are also **end-products**.
- **No residue, effluent or emission** is produced.



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AN EXAMPLE OF A CLEAN, CARBOCHEMICAL PROCESS: PRODUCTION OF REFINED NAPHTHALENE

CONCLUSIONS

About the product:

- Highest purity; Sulfur content below 2 ppm.
- High added value.
- Potential for chemical synthesis: plastics, pharmaceuticals.
- Environmentally friendly in its uses.

About the process:

- Best available technology for Refined Naphthalene Production.
 - High yield in refined naphthalene.
 - Optimum utilisation of natural resources.
 - Environmentally friendly: no residues.
 - Technology patented and prototype plant in operation.
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