

Natural Polymers – Adding Value by Radiation Technology

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International Atomic Energy Agency Scientific Forum

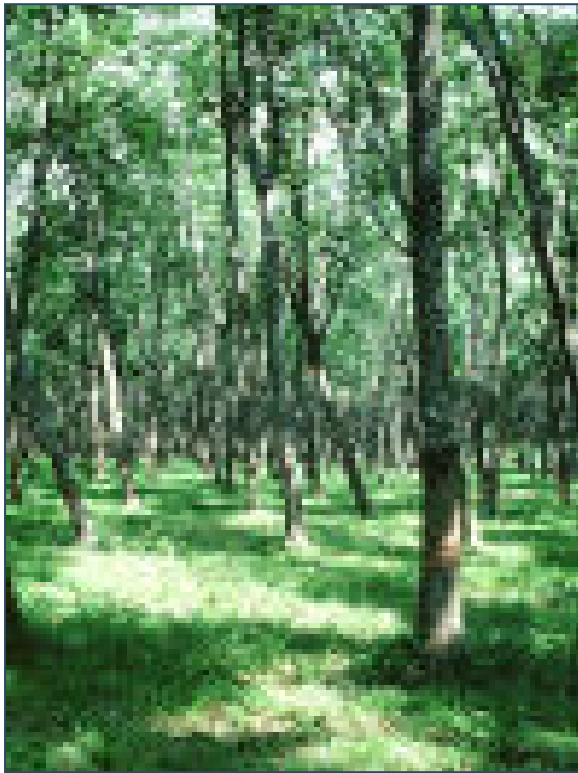
ATOMS IN INDUSTRY

Radiation Technology for Development

15–16 September 2015, Vienna, Austria

Natural Polymers – Adding Value by Radiation Technology

Source of Natural Polymers



RUBBER TREE

- Latex
- Rubber wood
- Rubber fibers



Natural Polymers – Adding Value by Radiation Technology

Source of Natural Polymers

SAGO PALM:
Metroxylon Sagu



Sago waste

Sago powder



Natural Polymers – Adding Value by Radiation Technology

Source of Natural Polymers

CHITIN/ CHITOSAN



Shrimp shells



Crab shells



SEAWEEDS



Carrageenan



Alginates



Natural Polymers – Adding Value by Radiation Technology

Source of Natural Polymers



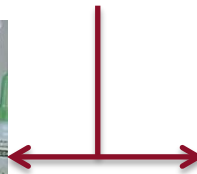
PALM TREE



Palm oil

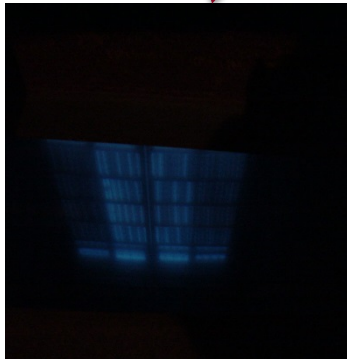
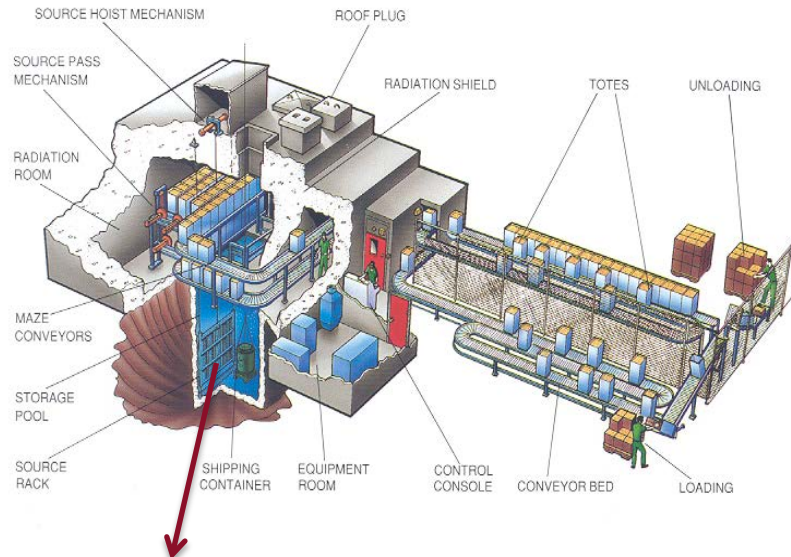


Oil Palm Dry Long Fibre



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Irradiation Facilities



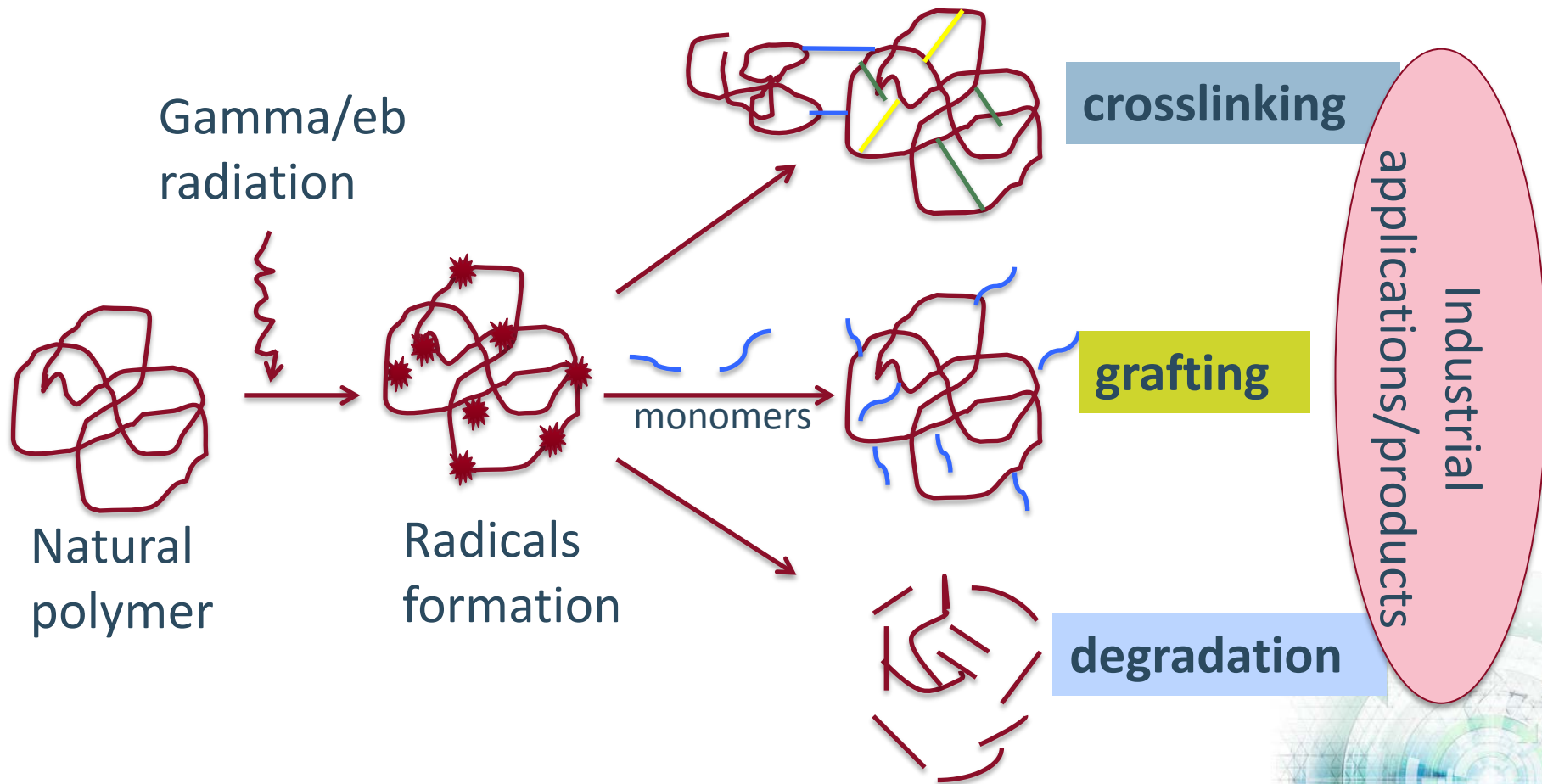
**Gamma/
Cobalt-60**
irradiation
Plant



**Electron
beam
(accelerator)**
irradiation
plant

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Radiation Processing of Natural Polymer



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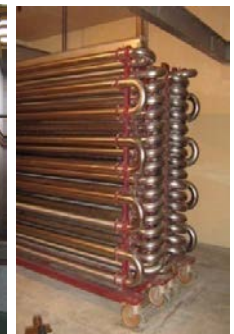
Radiation Pre vulcanized Natural Rubber Latex (RVNRL) Production at Nuclear Malaysia

- Sulfur free products
- Free from nitrosamines and low in nitrosatables
- Free from chemical induced allergies
- Low protein content
- Better clarity
- Lower ash residue and acid combustion gases
- Non-copper staining
- Better biodegradability



Formulation & storage tanks

Finger
cots



gloves



balloon



Natural Polymers – Adding Value by Radiation Technology

Commercial Production of Oligochitosan as Plant Growth Promoter



Formulation & storage tank at Nuclear Malaysia



Commercial



oligochitosan



commercial oligochitosan

Paddy

23/7/12

27/7/12



Chili plant

Agarwood



Egg plant



Irradiation room



Oligo chitosan

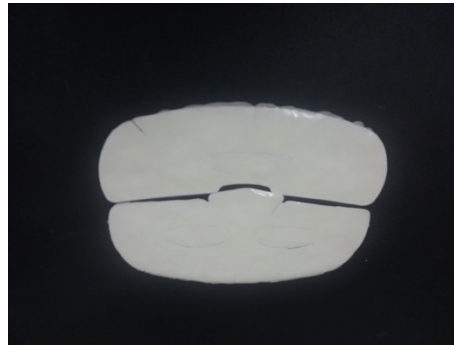


Natural Polymers – Adding Value by Radiation Technology

Sago hydrogel for cosmetic and health care applications



Commercial production line
– Jiang Su Dahheng Rumbia
Biotech Co. Ltd.



Sago
hydrogel
facial
mask



Advantages

- Soft and Flexible
- Retains Moisture
- Ability to Absorb Exudates
- Barrier against Contamination
- Anti-Microbial & Anti-Oxidant
- Reduces scar formation

Other applications

- Coolant for fever
- Wound dressing
- Hydrogel mat, bedsore



Natural Polymers – Adding Value by Radiation Technology

Palm Oil based acrylate for OPV – Pilot plant at Nuclear Malaysia

Overprint Varnish (OPV) based on Palm Oil for POSTER, Book cover etc..



Thank you!

