

Dear Madam or Sir

We hope this email finds you well, healthy, and just before summer vacation, which we hope this year will be more pleasant than it was last year. We want to share with you our next Newsletter containing the July updates. At the beginning of this month, we had an opportunity to participate in **Singapore International Water Week 2021**. We enjoyed the presentations, the relevant discussions, legislation updates, meeting with potential customers and the new technologies that were presented at the event.

From our R&D department we are happy to provide you with a new update regarding customer projects.

Successful laboratory study on the railway sleeper's decontamination and recovery.

The Problem:

For safety and operational requirements, railway sleepers are covered with protecting material as **coal tar** derivatives like **creosote**. Creosote has been used for over 150 years to preserve and increase the lifespan of timber. For example, in 2010 95% wooden sleepers were treated with that chemical. The creosote increases the life of the sleeper for 10 to 30 years. Because of the high concentration of benzopyrene which is carcinogenic material the EU allows to use of creosote only for industrial applications (as railway sleepers).



The heating value of old wooden sleepers is very high, 16.5 MJ/kg which makes sleepers recovery crucial from the environmental and economic perspectives. However, the presence of creosote leftovers makes wood sleeper's recycling almost impossible, and they need to be treated as dangerous materials. Therefore, the target of the study was efficient washing and decomposition of coal tar leftovers from the sleepers and wood recovery.

The Objective

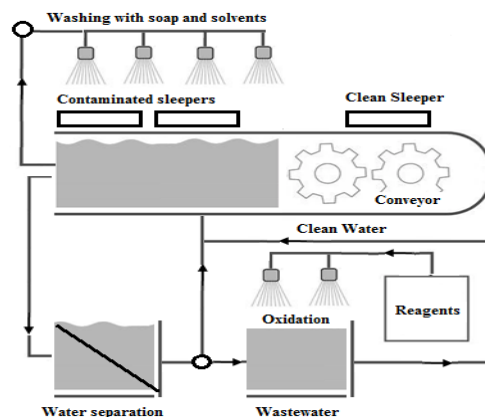
Therefore, the target of the study was efficient, rapid, simple and cost-effectively washing and decomposition of coal tar leftovers from the sleepers and wood recovery.

The Solution:

We have implemented a multistage laboratory treatment process for several used railway sleepers. The stages are:

1. Washing of the sleepers with solvents and emulsifiers.
2. Separation of the organic phase.
3. Chemical oxidation of wastewater (organic phase).
4. Water recovery for washing of new batch of sleepers.
5. The sleepers can be shredded/cut or used as-is.

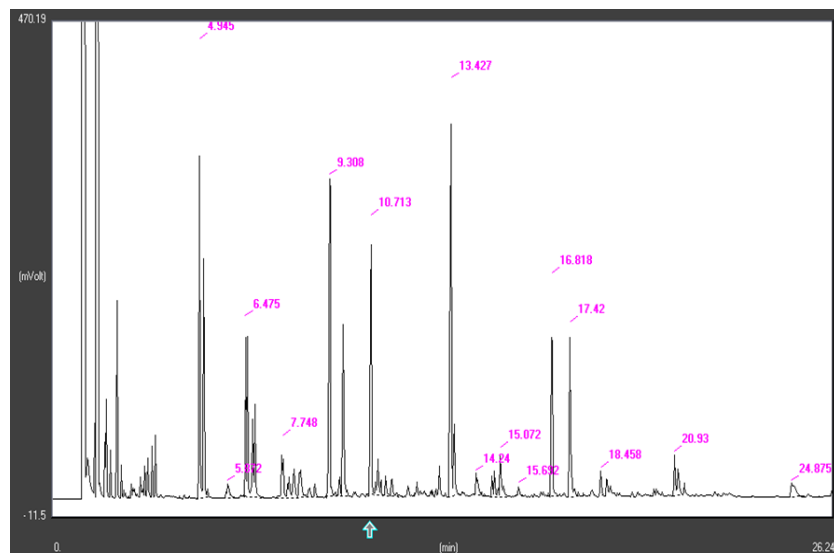
As a result, our SOA technology could be efficiently applied for sleeper treatment, decontamination, and recovery.



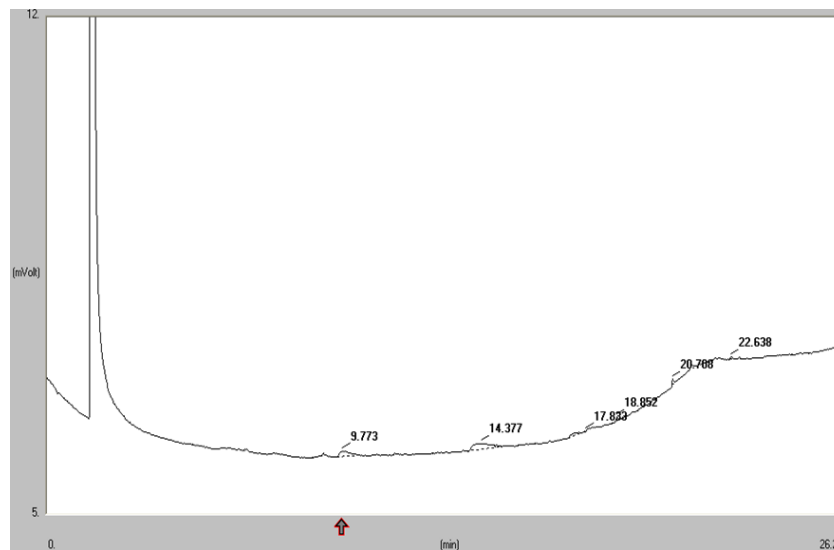
Results

	Contamination Level Before Treatment (ppm mg/kg)	Contamination Level After Treatment (ppm mg/kg)	Conversion [%]	Treatment Time [h]
Bulk of Coal tar in water	20,500	41	99.8	40 min
Coal tar from used Sleepers in water	452	0.9	99.8	45 min

Before
Coal Tar



After
Coal Tar



Alpha Cleantec AG

Newsletter July 2021



Maybe you face similar challenges in your business. Then please feel free to contact us.

Sincerely,

Your Alpha Cleantec Team

About Alpha Cleantec AG

We believe that our eco-system requires looking after so we have a world worth living in to pass to our next generations. Decontamination of soil and water from hazardous contaminants plays a major role in this regard, in our view. This is why we established Alpha Cleantec AG as an environmental technology company in 2016 with a vision to provide safe, green, rapid, efficient and cost effective technologies to resolve environmental harms and hazards caused by inadequate human and industrial activities.

Alpha Cleantec AG provides two technologies, AFA and SOA, achieving decontamination ratios of up to 97% for a wide range of contaminants in just hours (such as Hydrocarbons, BTEX, Petroleum leftovers, Aromatics, PAHS, Chlorinated Solvents, PCBs, Dioxins as well as Pesticides and Herbicides) to be applied for soil, wastewater and railway ballast treatment.

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Table of contaminants treatable by our technologies

CONTAMINANTS	IN-SITU		ON SITE	
	SOA	AFA	SOA	AFA
BTEX				
Benzene	*	*	*	*
Toluene	*	*	*	*
Ethylbenzene	*	*	*	*
Xylene	*	*	*	*
PETROLEUM HYDROCARBONS				
Gasoline Range Organics (GRO)	*	*	*	*
Diesel Range Organics (DRO)	*	*	*	*
Oil Range Organics (ORO)	*	*	*	*
AROMATICS				
Chlorobenzene	*	*	*	*
Bromobenzene	*	*	*	*
Dichlorobenzene	*	*	*	*
Nitrobenzene	*	*	*	*
Phenol	*	*	*	*
Styrene	*	*	*	*
Naphthalene	*	*	*	*
Trichlorobenzene	*	*	*	*
Trimethylbenzene	*	*	*	*
PAHS				
Phenathrene	*	*	*	*
Naphthalene	*	*	*	*
Acenaphthylene	*	*	*	*
CHLORINATED SOLVENTS				
Tetrachloroethylene	*	*	*	*
Trichloroethene	*	*	*	*
Dichloroethene	*	*	*	*
Vinyl chloride	*	*	*	*
Tetrachloroethane	*	*	*	*
Trichloroethane	*	*	*	*
Dichloroethane	*	*	*	*
Dibromochloroethane	*	*	*	*
Bromodichloromethane	*	*	*	*
Carbon tetrachloride	*	*	*	*
Chloroethane	*	*	*	*
Chloroform	*	*	*	*
Chloromethane	*	*	*	*
Chlorotoluene	*	*	*	*
Methylene chloride	*	*	*	*
PCBS				
DIOXINS				
PESTICIDES AND HERBICIDES				
Glyphosate	*	*	*	*
Goal	*	*	*	*

We plan to inform you in future whenever we accomplished projects, pilots or case studies. If you do not wish to get our company news, please let us know.

Kind regards

Mit freundlichen Grüßen

Andreas Danner

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