# Article information:

Directed transforming of coke to active intermediates in methanol-to-olefins catalyst to boost light olefins selectivity | Nature Communications
<https://www.nature.com/articles/s41467-020-20193-1>

# Article summary:

1. Methanol-to-olefins (MTO) over zeolitic catalyst is an important process for producing light olefins from non-oil feedstocks.

2. Despite progress in research, concurrently pursuing long catalyst lifetime and high light olefins selectivity in MTO remains a challenge.

3. This article proposes a regeneration strategy to directionally transform coke to active HCPs within nano-confined spaces of industrially important SAPO-34 zeolites, which can restore catalytic activity and promote light olefins selectivity in MTO reaction.

# Article rating:

May be slightly imbalanced: The article presents the information in a generally reliable way, but there are minor points of consideration that could be explored further or claims that are not fully backed by appropriate evidence. Some perspectives may also be omitted, and you are encouraged to use the research topics section to explore the topic further.

# Article analysis:

The article is generally reliable and trustworthy, as it provides evidence for the claims made through theoretical calculations and laboratory experiments. The authors have also provided insights into the potential biases of the study, such as the difficulty of synthesizing targeted zeolites with specific OSDAs due to their complexity, and the diffusion limitation caused by steric hindrance when co-feeding aromatics. Furthermore, they have explored counterarguments such as using air combustion or steam gasification to eliminate coke for catalytic activity recovering, which lowers light olefins selectivity due to elimination of active HCPs.

However, there are some points that could be further explored in the article. For example, while the authors have discussed how coke can be transformed to naphthalenic species via thermal cracking at high temperature, they do not provide any evidence on how this transformation affects other parameters such as catalyst lifetime or product yield. Additionally, they do not discuss any possible risks associated with this method such as environmental impacts or safety concerns that may arise from using high temperatures and steam cracking. Finally, while they have discussed various methods for modulating product selectivity via tailoring HCPs confined in zeolites for MTO reactions, they do not provide any comparison between these methods and their proposed method in terms of efficiency or cost effectiveness.

# Topics for further research:

* Catalyst lifetime and product yield
* Environmental impacts of thermal cracking
* Safety concerns of steam cracking
* Comparison of tailoring HCPs methods
* Efficiency of tailoring HCPs methods
* Cost effectiveness of tailoring HCPs methods

# Report location:

<https://www.fullpicture.app/item/f5ed8b97f28060600b3fc1881fd6da0f>