

CONCEPT BOOSTER

Dear students! Thank you all a lot for the feedback that you have given for the last article. This is the last part of Organometallic Compounds. Hopefully, this will fulfil the requirement of COMPETITIVE EXAMINATIONS you are going to face. Moreover, some more problems will be given in upcoming issues. Do read the basics of every chapter very carefully. Do take care, all the best!

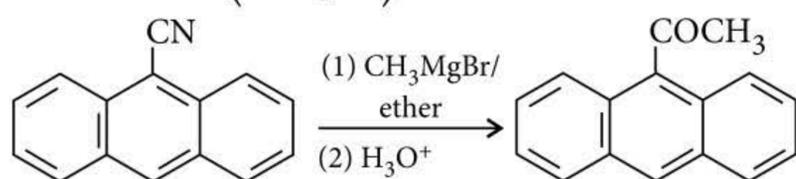
*Arunava Sarkar

A BRIEF OVERVIEW OF ORGANOMETALLIC REAGENTS AND ORGANOMETALLIC CHEMISTRY

GRIGNARD REAGENTS

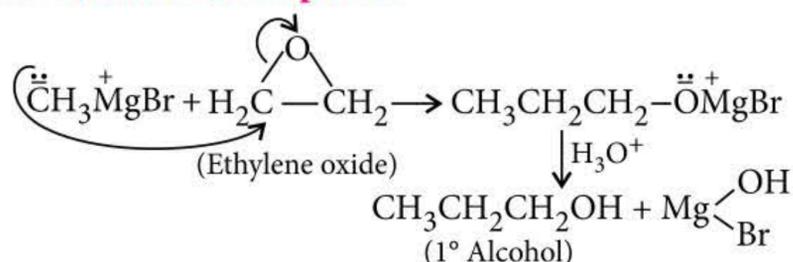
○ Reaction with nitriles

Remember the basic idea here which is, wherever -CN group is connected, remove it from there and add -COCH₃ (or -C(=O)-R).

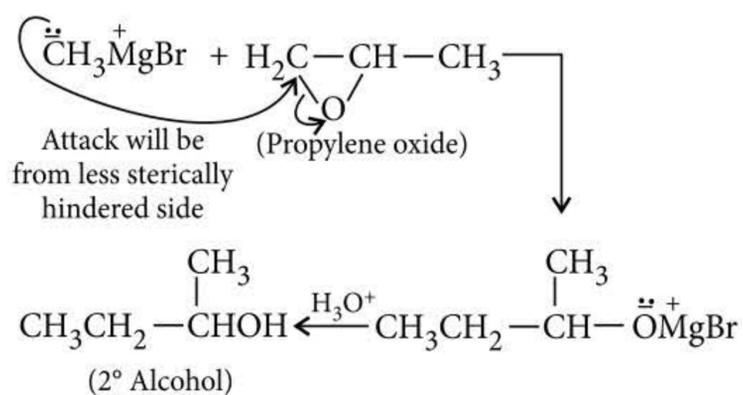


[-CH₃ or -R comes from Grignard reagent]

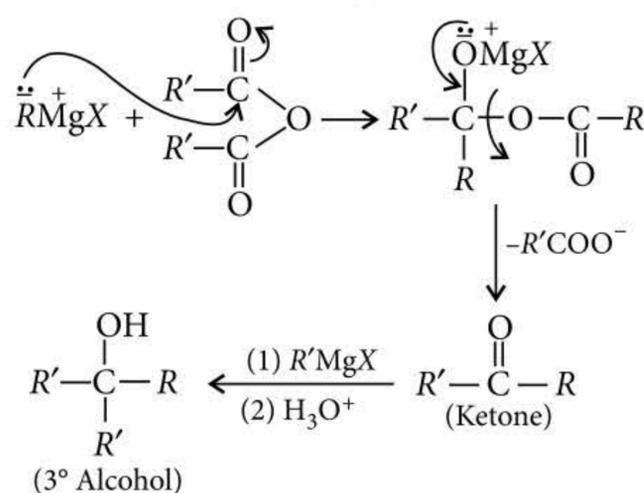
○ Reaction with epoxide



If you use substituted epoxide, then you can also get 2° alcohol.

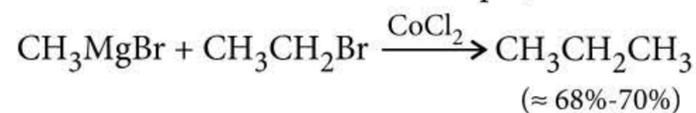


○ Reaction with acid anhydride

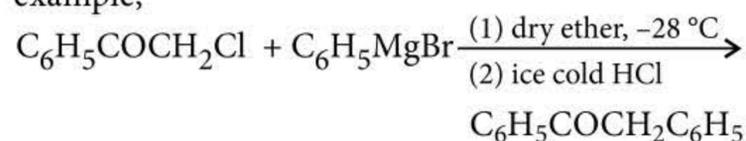


○ Reaction with alkyl halide

Reaction between Grignard reagent and an alkyl halide is often carried out very slowly as Grignard reagent is prepared from alkyl halide. So, the reaction between Grignard reagent and alkyl halide is carried out in presence of transition metal catalyst, specifically cobalt chloride (CoCl₂). This kind of transition metal catalysed reaction is known as Kharasch reaction. For example,



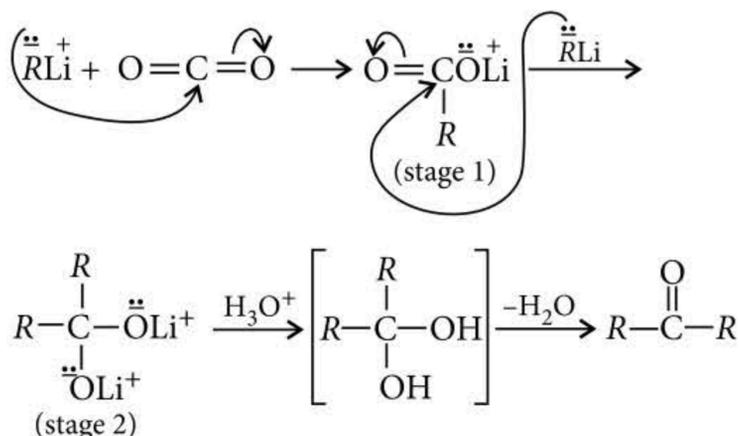
It has been found that a reaction is possible in between Grignard reagent and α-haloketone. For example,



*Institute of Chemistry (IOC)- Asansol, Durgapur, Dhanbad, Burdwan, Kolkata, Jamshedpur, Bokaro, Patna

However, lithium dialkyl cuprates give exclusively 1,4-addition product.

○ **Reaction with carbon dioxide**

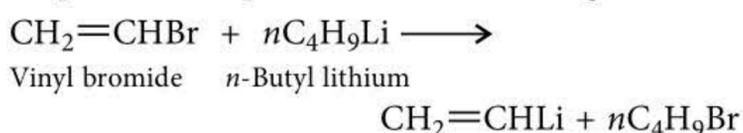


So, here is an important difference with the Grignard reagent. In case of Grignard reagent, the reaction stops at stage 1 *i.e.*, 1 mole addition of Grignard reagent but in case of organolithium compounds, the reaction goes upto stage 2 *i.e.*, 2 moles addition of organolithium compound.

○ **Electrophilic displacement**

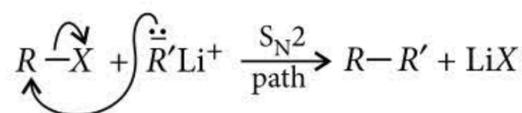


A specific example of this kind can be given :

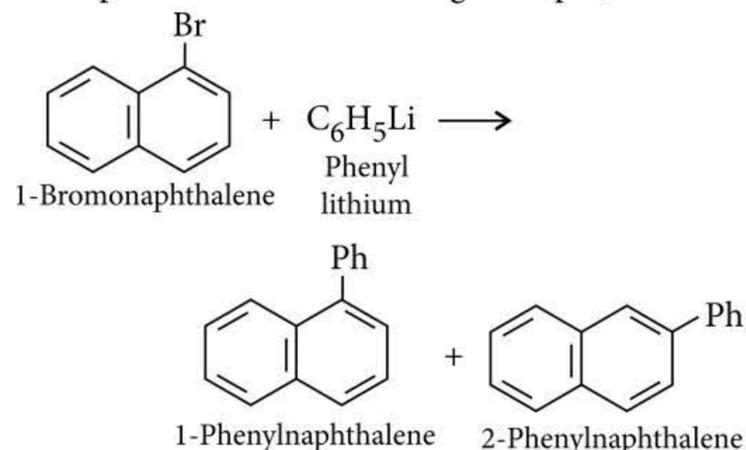


○ **Nucleophilic displacement**

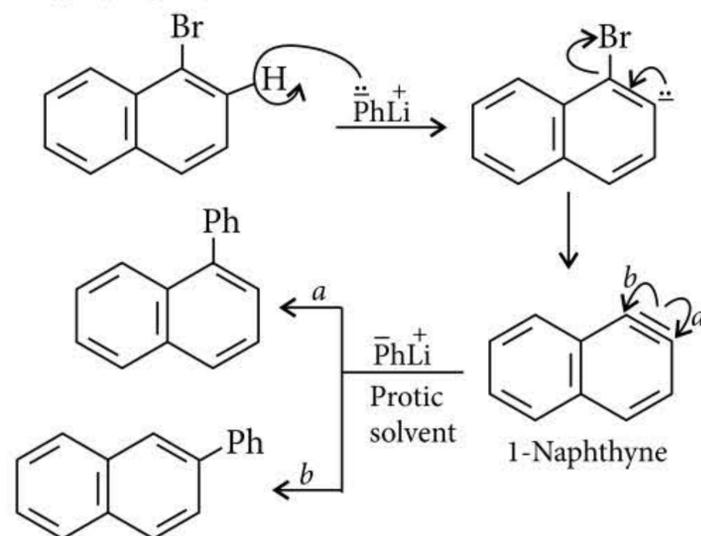
Here, a similar reaction as happens in Wurtz reaction takes place.



It is to be remembered that in case of substitution in aromatic rings, elimination-addition reaction takes place. Take the following example,



Mechanism :



AVAILABLE BOUND VOLUMES

		Physics For You 2016 (January - December)	₹ 325 12 issues	of your favourite magazines How to order : Send money by demand draft/money order. Demand Draft should be drawn in favour of MTG Learning Media (P) Ltd. Mention the volume you require along with your name and address. Add ₹ 60 as postal charges Older issues can be accessed on digital.mtg.in in digital form. Mail your order to : Circulation Manager, MTG Learning Media (P) Ltd. Plot No. 99, Sector 44 Institutional Area, Gurgaon, (HR) Tel.: (0124) 6601200 E-mail : info@mtg.in Web : www.mtg.in
		Mathematics Today 2016 (January - December)	₹ 325 12 issues	
		Biology Today 2016 (January - June)	₹ 175 6 issues	
		Chemistry Today 2016 (January - June)	₹ 175 6 issues	
		Mathematics Today 2013 (January - December)	₹ 300 12 issues	
buy online at www.mtg.in				