

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ



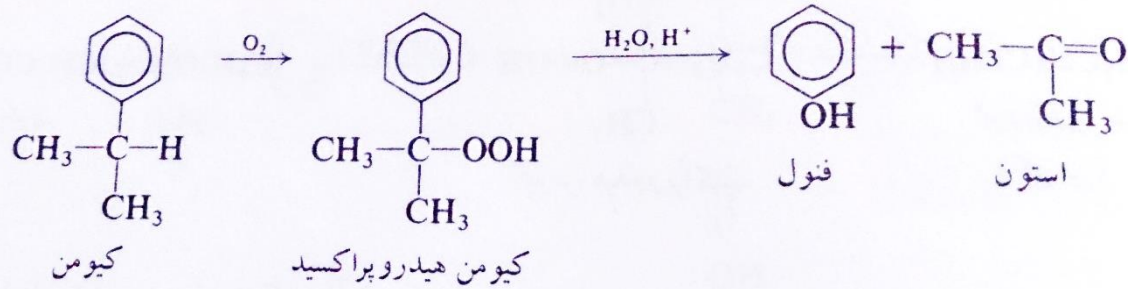
دانشکده فنی و حرفه‌ای ولی عصر(عج)

شیمی آلی ۳
کارشناسی

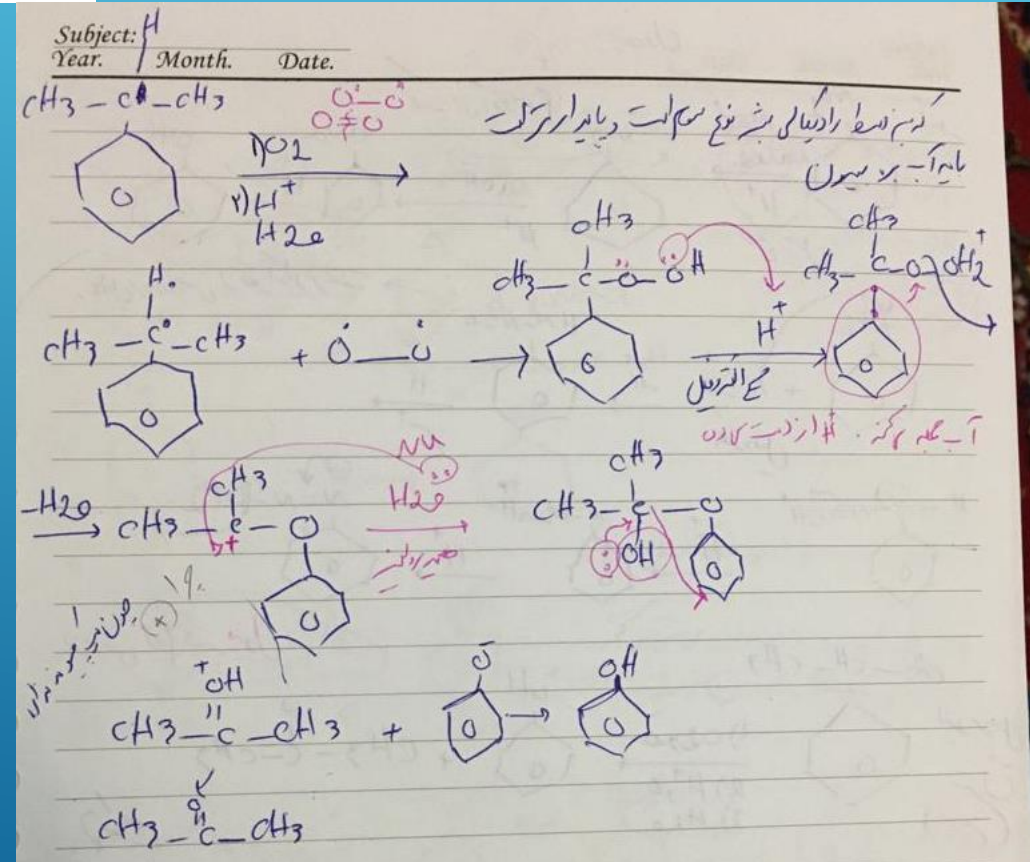
مبحث فنول‌ها

استاد زینلی

روش تهیه فنول: روش کیومن

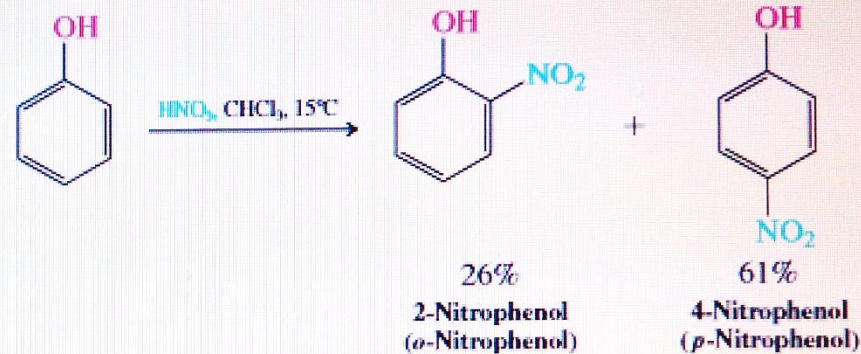
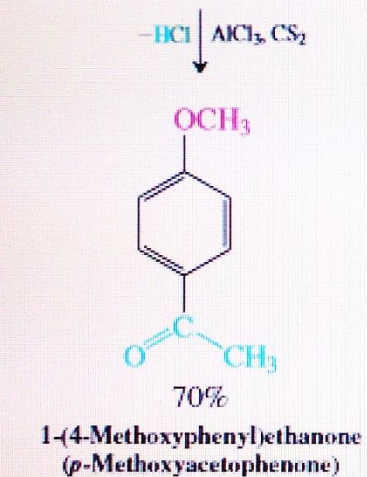
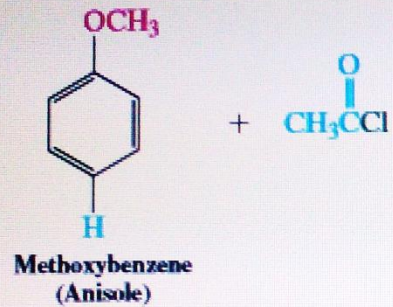


ایزوپروپیل بنزن



22-6 Electrophilic Substitution of Phenols

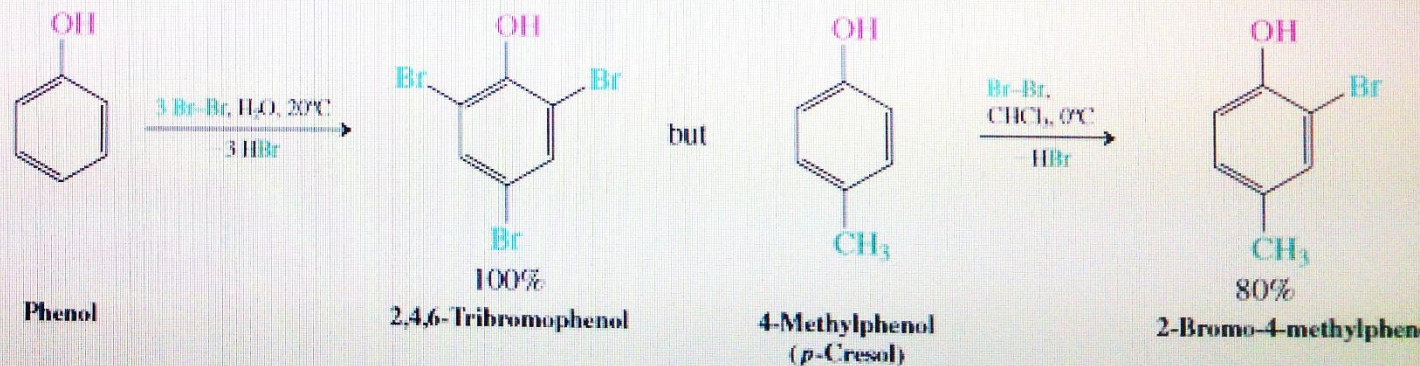
The aromatic ring in phenols is also a center of reactivity. The interaction between the OH group and the ring strongly activates the ortho and para positions toward electrophilic substitution (Sections 16-1 and 16-3). For example, even dilute nitric acid causes nitration.



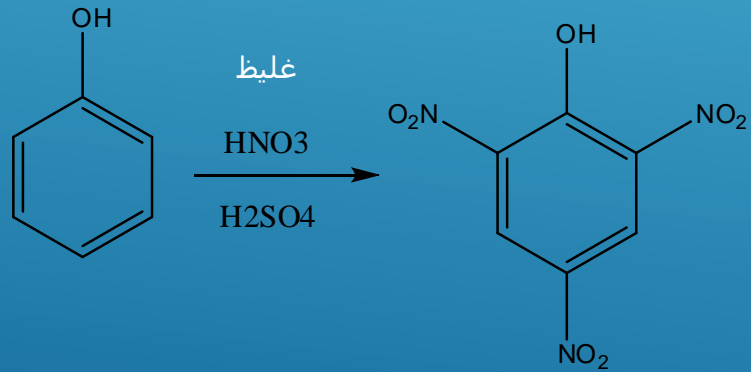
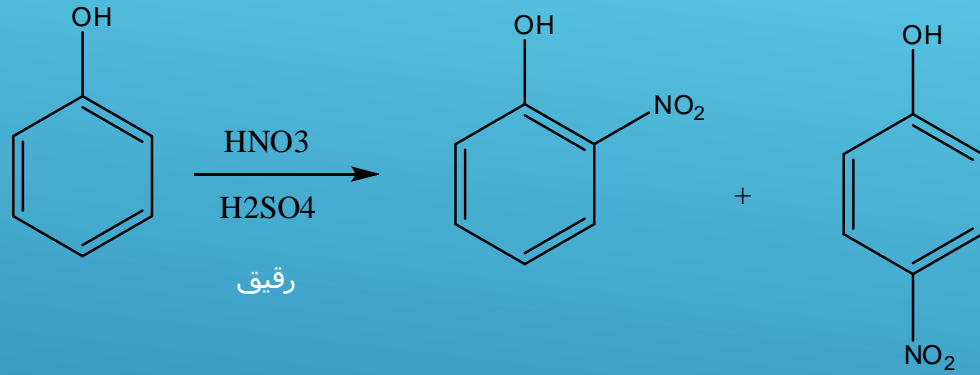
Friedel-Crafts acylation of phenols is complicated by ester formation and is better carried out on ether derivatives of phenol (Section 16-5), as shown in the margin.

Phenols are halogenated so readily that a catalyst is not required, and multiple halogenations are frequently observed (Section 16-3). As shown in the following reactions, tribromination occurs in water at 20°C , but the reaction can be controlled to produce the monohalogenation product through the use of a lower temperature and a less polar solvent.

Halogenation of Phenols

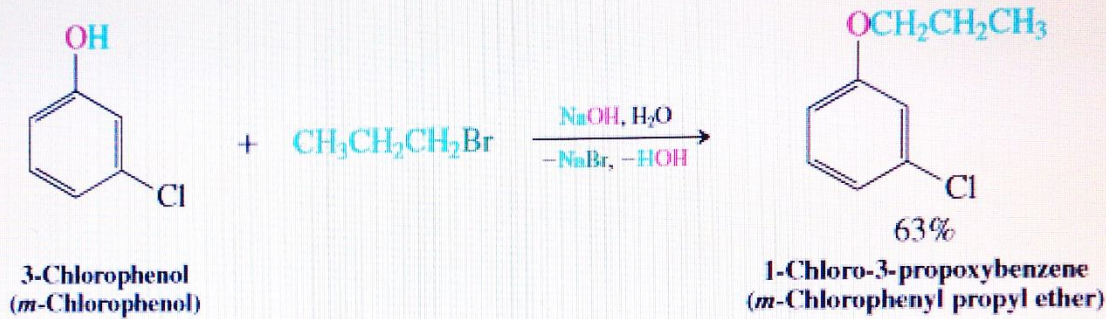


واکنش نیتراسیون

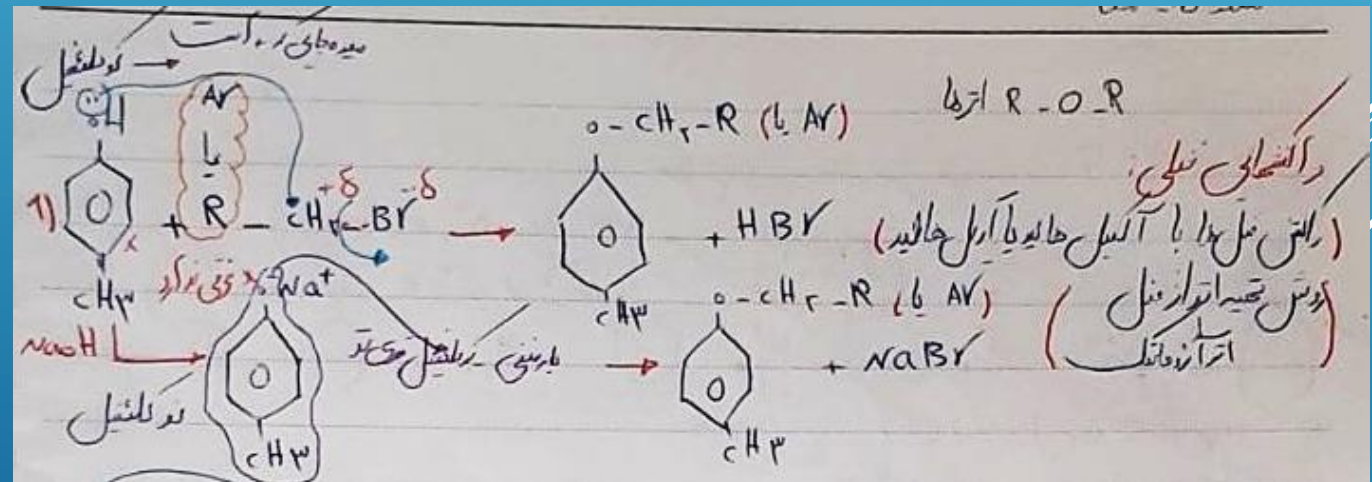


Alkoxybenzenes are prepared by Williamson ether synthesis

The Williamson ether synthesis (Section 9-6) permits easy preparation of many alkoxybenzenes. The phenoxide ions obtained by deprotonation of phenols (Section 22-3) are good nucleophiles. They can displace the leaving groups from haloalkanes and alkyl sulfonates.

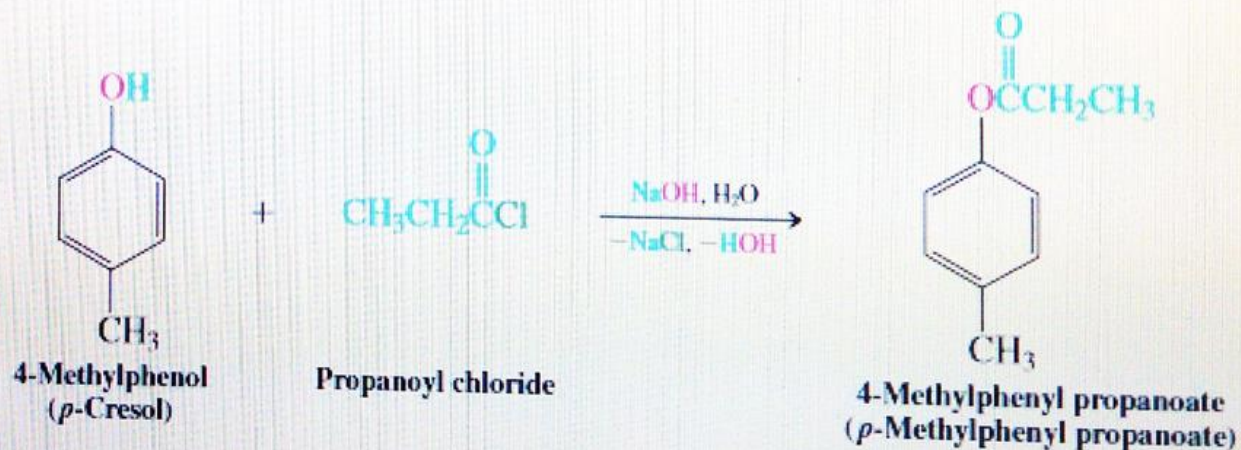


واکنشهای فنول ها

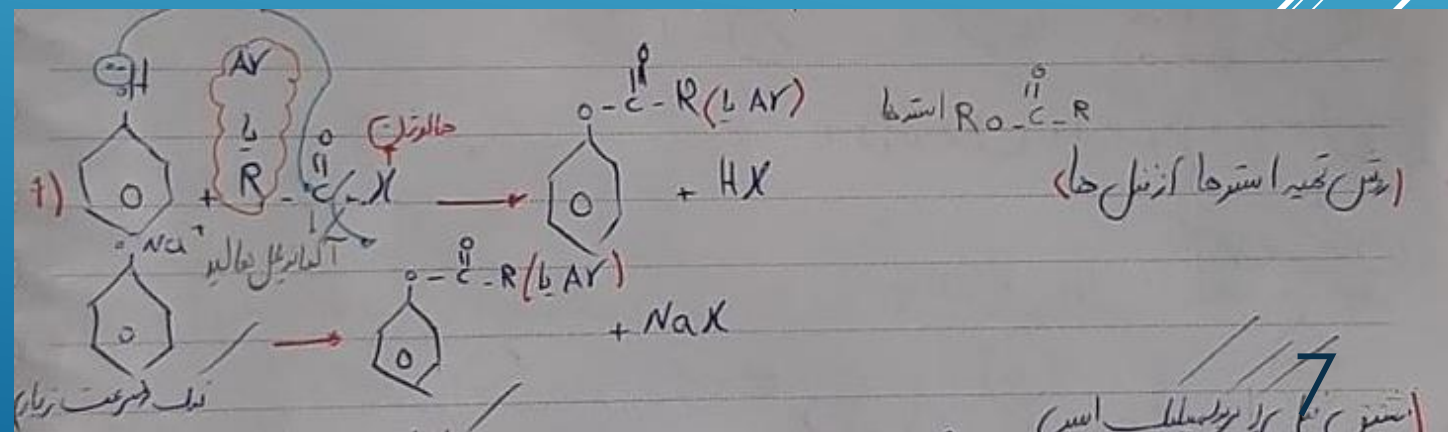


Esterification leads to phenyl alkanoates

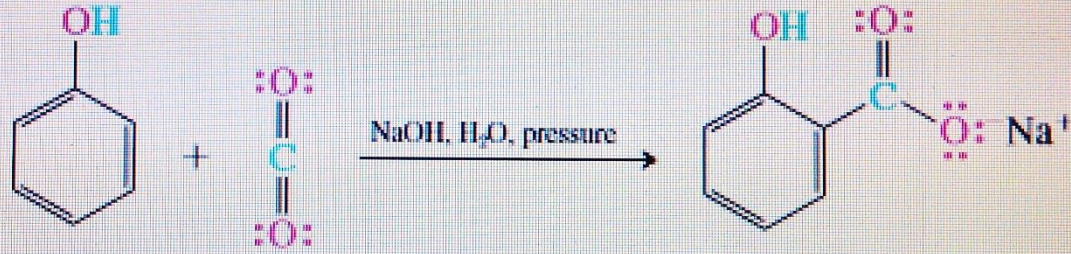
The reaction of a carboxylic acid with a phenol (Section 19-9) to form a phenyl ester is endothermic. Therefore, esterification requires an activated carboxylic acid derivative, such as an acyl halide or a carboxylic anhydride.



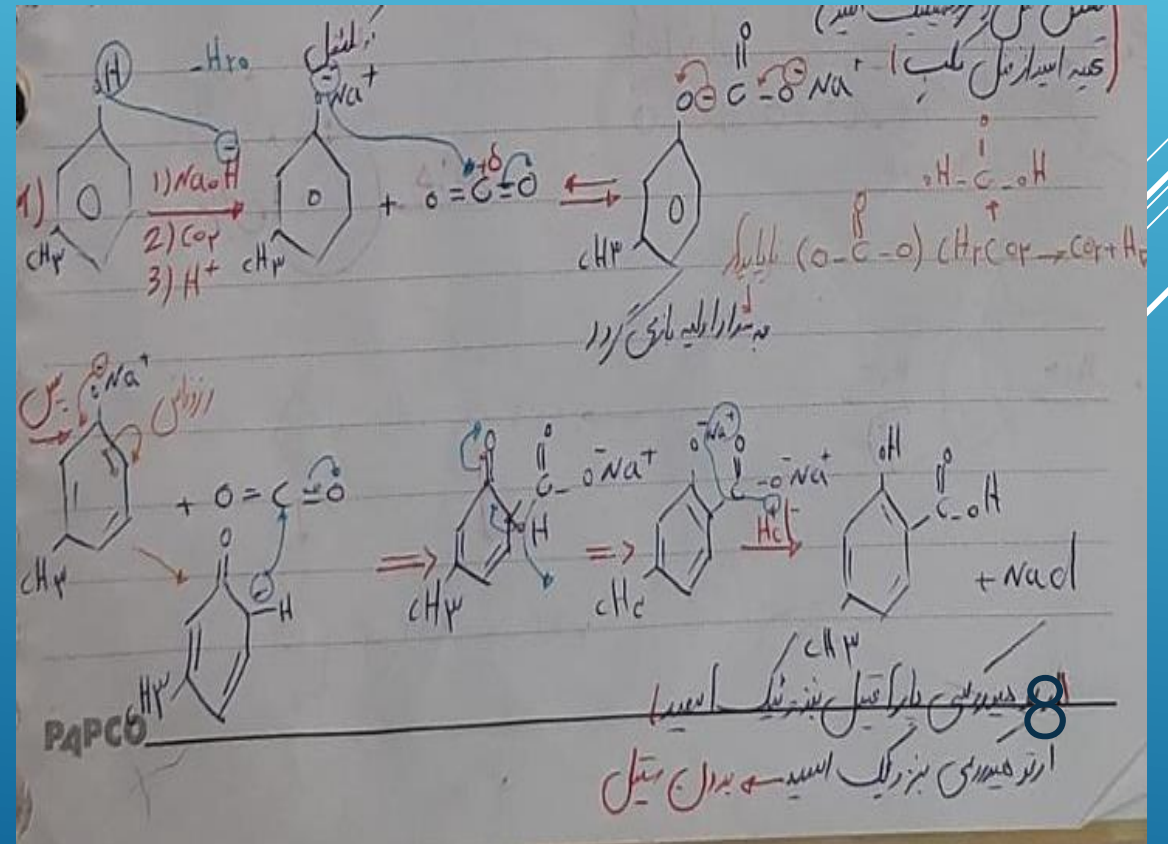
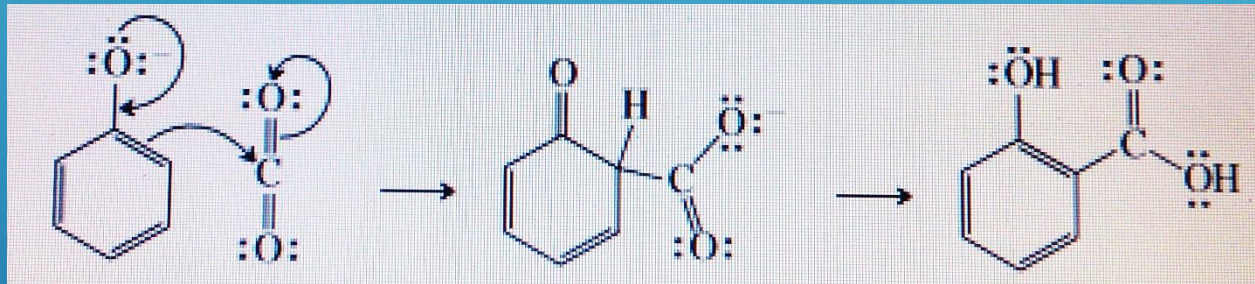
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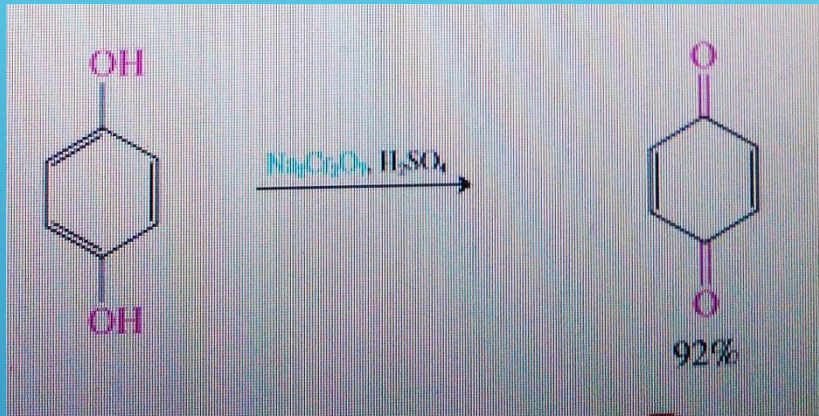


In the **Kolbe-Schmitt** reaction, phenoxide attacks carbon dioxide to furnish the salt of 2-hydroxybenzoic acid (*o*-hydroxybenzoic acid, salicylic acid, precursor to aspirin; see Chemical Highlight 22-2).

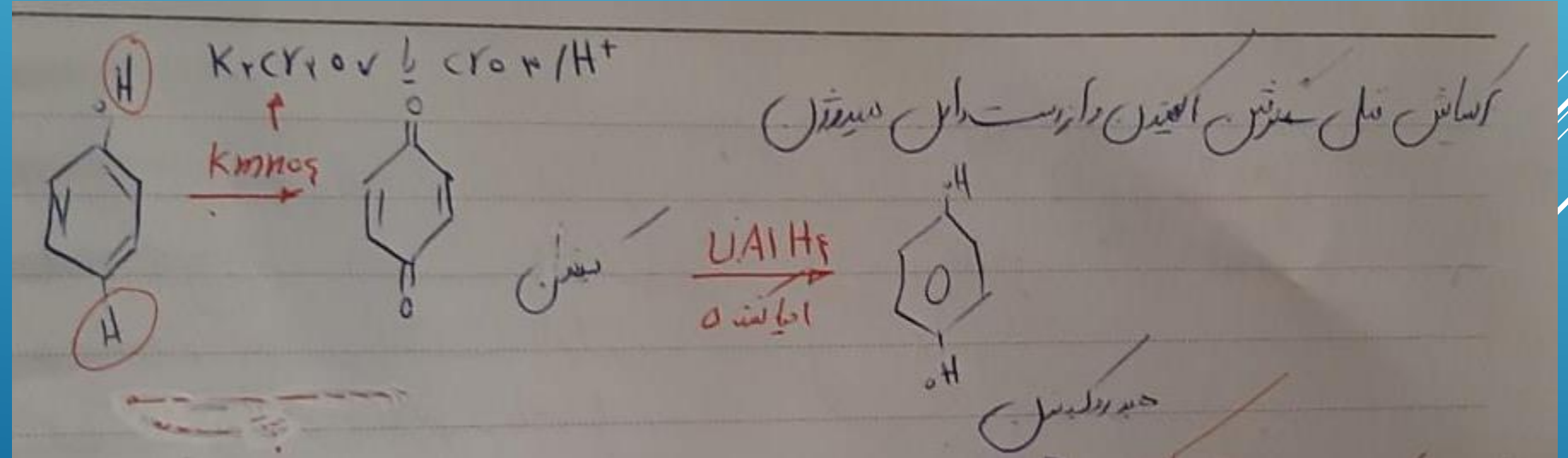


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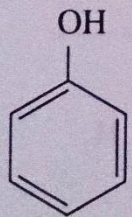


اکسایش فنول ها

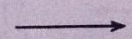
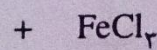


واکنش با آهن (III) کلرید

وقتی محلول خنثای آهن (III) کلرید را به فنول اضافه کنند، کمپلکسی به رنگ بنفش تشکیل می‌شود. از این واکنش برای شناسایی فنول استفاده می‌کنند



فنول



رنگ محلول حاصل بنفش است.

آهن (III) کلرید

مکانیسم تشکیل نمک دی آزونیم از آمین نوع اول

