

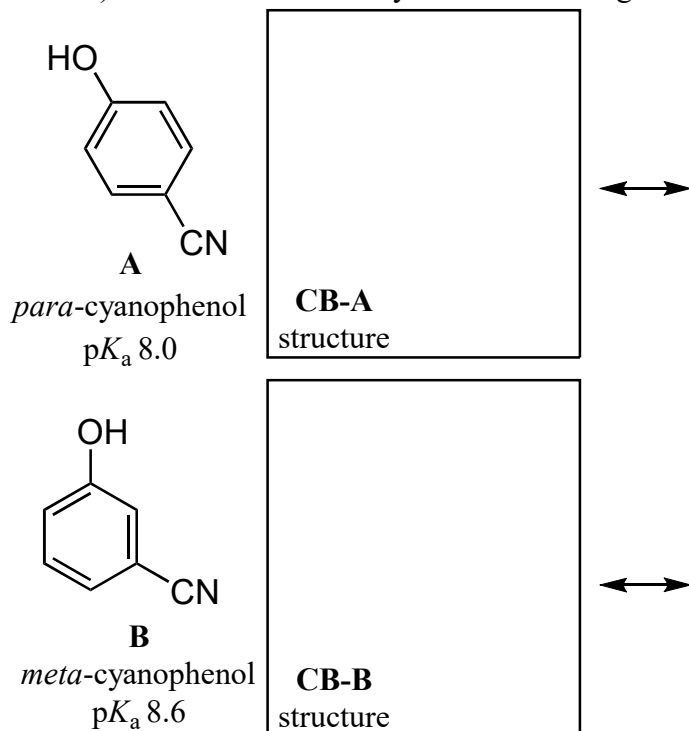
Compare Acid Strength Homework

Name: _____ Section (day/time): _____

The cyano group (-CN) is an electron-withdrawing group (EWG). The pK_a for para-cyanophenol (**A**) is 8.0 and the pK_a for meta-cyanophenol (**B**) is 8.6. Use this data to explain the effects of the cyano group on the acidity of phenol. **Resonance effects should be considered.** Use complete drawings to support your answer (*i.e.*, draw out the cyano group and ALL relevant resonance forms of each conjugate base).

Consider the following guiding questions as you prepare your explanation:

- 1) What do the conjugate bases of these phenols look like? (please refer to them as CB-A and CB-B)
- 2) Are the cyano groups involved in the resonance of CB-A and/or CB-B?
- 3) Which conjugate base is more stable? Why?
- 4) How does CB stability correlate to the given pK_a data of the parent acids?



Explain the difference in acidity (avoid the use of "it" and instead refer to A, B, CB-A, CB-B):