## Dr. Schneider, Chem 322.

## Monosubstituted benzenes. Ortho/Para and Meta-directing Groups

R	Substitution Pattern	Relative Rate of Reaction
H (benzene)		1
NH <sub>2</sub> , NHR, NR <sub>2</sub> OH OR alkyl NHCOR I, Br, CI, F	ortho/para ortho/para ortho/para ortho/para ortho/para ortho/para ortho/para ortho/para	Much Faster Much Faster Much Faster Faster Faster Slower
O Y= OH, OR, NH <sub>2</sub> , Cl, aryl, alkyl	meta	Slower <b>De</b> activators
SO <sub>3</sub> H NO <sub>2</sub> CN NR <sub>3</sub>	m-directors meta meta meta meta	Slower Slower Slower Slower

In General: o/p-directors are faster reactions compared to benzene ( except halides)

meta-directors are slower reactions compared to benzene