



**INDUCTIVE  
EFFECT  
GROUP 6**

# INDUCTIVE EFFECT

It is defined as permanent displacement of shared electron pair in carbon chain towards more electronegative atom or group

# TYPES OF INDUCTIVE EFFECT

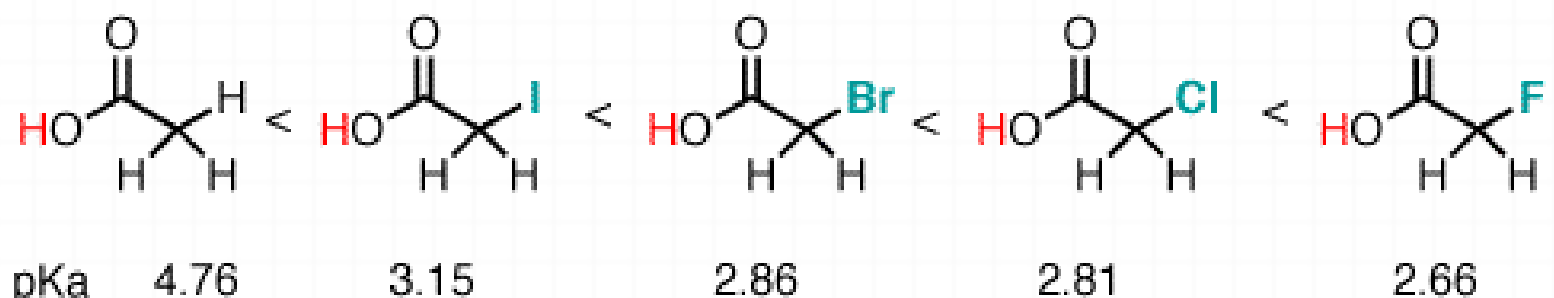
## **1. Negative Inductive effect (-I):**

the electron withdrawing nature of groups or atoms is called negative inductive effect. It is indicated by  $-I$ , following are the examples of groups in the decreasing order of their  $-I$  effect:

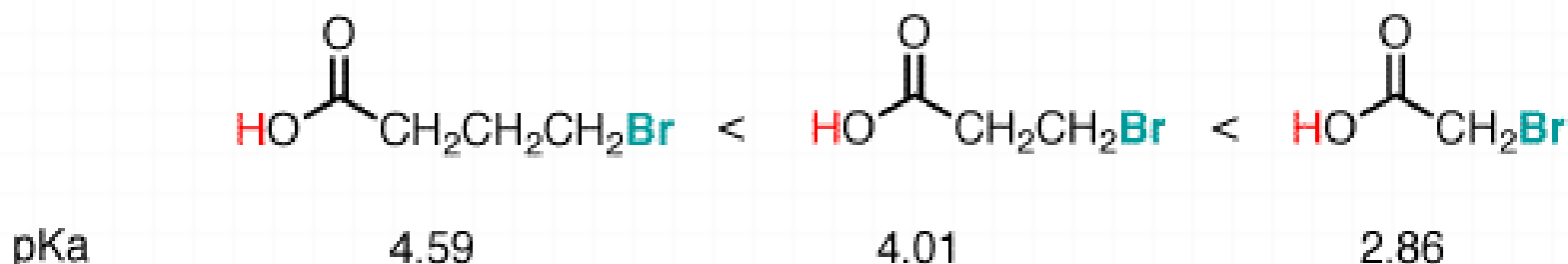
#### 4. Electronegativity and inductive effects:

Two principles - electron-withdrawing substituents can increase acidity of a nearby atom, which **increases with electronegativity** and **decreases with increasing distance to the atom**.

Electronegativity increases in the order  $F > Cl > Br > I$ :

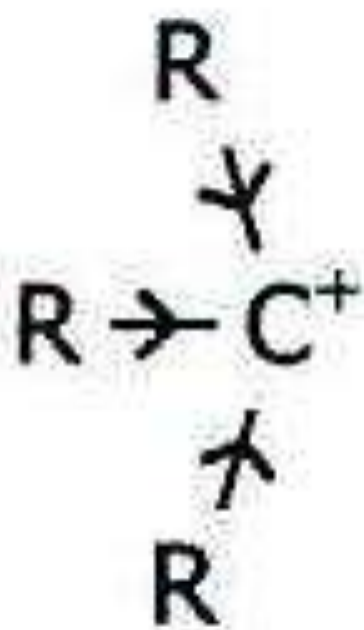
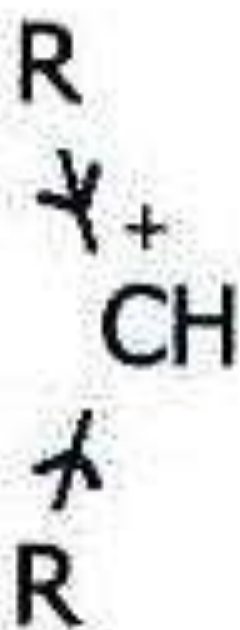
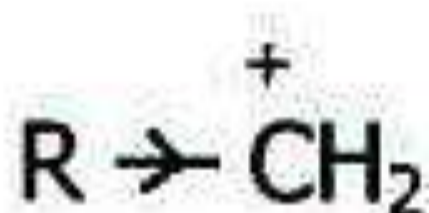


*More acidic*



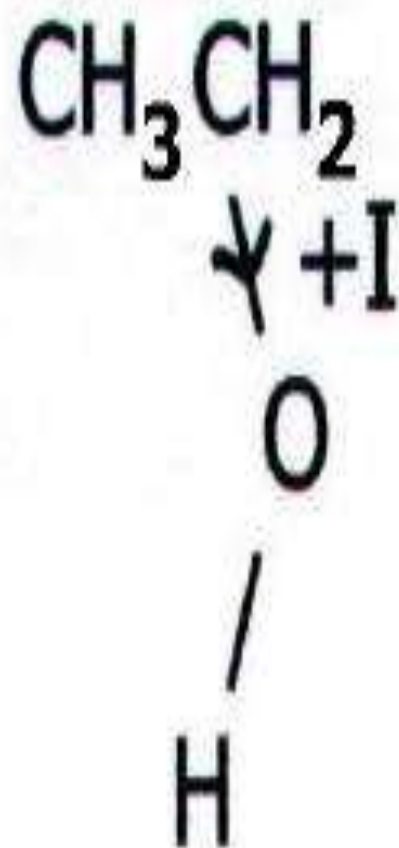
## 2. Positive Inductive effect (+I):

It refers to the electron increasing nature of the groups of atoms and is denoted by +I. the following are the examples of groups in the decreasing order of their +I effect.

 $>$  $>$ 



stronger base than



# APPLICATIONS OF INDUCTIVE EFFECT

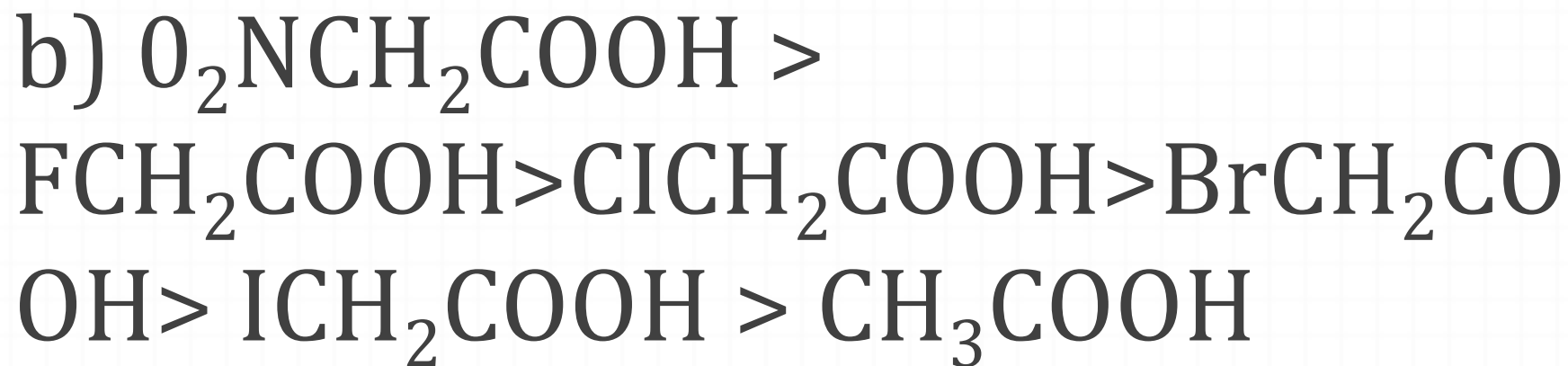
Inductive effect is useful in explaining the strength of some organic acids and bases.

a) Effect is substituent on the acid strength of aliphatic acids.



Reason: acidic strength decreases as +I effect of the alkyl group increases





Reason: acidic strength decreases  
as  $-I$  effect of the group or halogen  
decreases.