

Calculation of pH of a mixture of two flows. Based on the  
 procedure in EPA's DESCON program (EPA, 1988. Technical  
 Guidance on Supplementary Stream Design Conditions for Steady  
 State Modeling. USEPA Office of Water, Washington D.C.)

**INPUT**

1. DILUTION FACTOR AT MIXING ZONE BOUNDARY	5.000
RECEIVING WATER CHARACTERISTICS	
2. Temperature (deg C):	33.00
3. pH:	8.00
4. Alkalinity (mg CaCO <sub>3</sub> /L):	184.00
EFFLUENT CHARACTERISTICS	
5. Temperature (deg C):	31.00
6. pH:	6.00
7. Alkalinity (mg CaCO <sub>3</sub> /L):	150.00

**OUTPUT**

1. IONIZATION CONSTANTS	
Upstream/Background pKa:	6.31
Effluent pKa:	6.32
2. IONIZATION FRACTIONS	
Upstream/Background Ionization Fraction:	0.98
Effluent Ionization Fraction:	0.32
3. TOTAL INORGANIC CARBON	
Upstream/Background Total Inorganic Carbon (mg CaCO <sub>3</sub> /L):	187.77
Effluent Total Inorganic Carbon (mg CaCO <sub>3</sub> /L):	463.05
4. CONDITIONS AT MIXING ZONE BOUNDARY	
Temperature (deg C):	32.60
Alkalinity (mg CaCO <sub>3</sub> /L):	177.20
Total Inorganic Carbon (mg CaCO <sub>3</sub> /L):	242.82
pKa:	6.31
<b>pH at Mixing Zone Boundary:</b>	<b>6.74</b>

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**INPUT**

1. DILUTION FACTOR AT MIXING ZONE BOUNDARY	5.000
RECEIVING WATER CHARACTERISTICS	
2. Temperature (deg C):	33.00
3. pH:	8.00
4. Alkalinity (mg CaCO <sub>3</sub> /L):	184.00
EFFLUENT CHARACTERISTICS	
5. Temperature (deg C):	31.00
6. pH:	9.00
7. Alkalinity (mg CaCO <sub>3</sub> /L):	150.00

**OUTPUT**

1. IONIZATION CONSTANTS	
Upstream/Background pKa:	6.31
Effluent pKa:	6.32
2. IONIZATION FRACTIONS	
Upstream/Background Ionization Fraction:	0.98
Effluent Ionization Fraction:	1.00
3. TOTAL INORGANIC CARBON	
Upstream/Background Total Inorganic Carbon (mg CaCO <sub>3</sub> /L):	187.77
Effluent Total Inorganic Carbon (mg CaCO <sub>3</sub> /L):	150.31
4. CONDITIONS AT MIXING ZONE BOUNDARY	
Temperature (deg C):	32.60
Alkalinity (mg CaCO <sub>3</sub> /L):	177.20
Total Inorganic Carbon (mg CaCO <sub>3</sub> /L):	180.28
pKa:	6.31
<b>pH at Mixing Zone Boundary:</b>	<b>8.07</b>