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Atmospheric Chemistry Formulas

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List of 10 Atmospheric Chemistry Formulas

Atmospheric Chemistry

1) Affluence Count by IPAT Equation

$$fx \quad A = \frac{I}{T \cdot P}$$

Open Calculator 

$$ex \quad 20 = \frac{1000}{5 \cdot 10}$$

2) Drake's Equation for Number of Planets with Intelligent Communicative Extraterrestrial Life

$$fx \quad N_{\text{civilization}} = (R \cdot f_p \cdot f_l \cdot n_e \cdot f_i \cdot f_c \cdot L)$$

Open Calculator 

$$ex \quad 4.7E^7 = (24 \cdot 7 \cdot 11 \cdot 6 \cdot 14 \cdot 12 \cdot 25)$$

3) Human Impact on Environment by IPAT Equation

$$fx \quad I = (P \cdot A \cdot T)$$

Open Calculator 

$$ex \quad 1000 = (10 \cdot 20 \cdot 5)$$

4) Instantaneous Growth Rates of Predator using Lotka Volterra Equation

$$fx \quad dP/dt = (c \cdot a' \cdot N_{P/C} \cdot N) - (q \cdot N_{P/C})$$

Open Calculator 

$$ex \quad 2081.7 = (4 \cdot 22 \cdot 3 \cdot 8) - (10.1 \cdot 3)$$



5) Instantaneous Growth Rates of Prey using Lotka Volterra Equation

$$\text{fx } dN/dt = ((r \cdot N) - (a' \cdot N_{P/C} \cdot N))$$

[Open Calculator !\[\]\(cbe80b694ebd74fcfe136a095b608235_img.jpg\)](#)

$$\text{ex } 32 = ((70 \cdot 8) - (22 \cdot 3 \cdot 8))$$

6) Net Biomass

$$\text{fx } N_{\text{biomass}} = I_{\text{biomass}} - D_{\text{biomass}}$$

[Open Calculator !\[\]\(3e2231b1ad3ca8da8658228c00dd08e0_img.jpg\)](#)

$$\text{ex } 84\text{kg/m}^2 = 100\text{kg/m}^2 - 16\text{kg/m}^2$$

7) Net Primary Production

$$\text{fx } \text{NPP} = I_{\text{biomass}} - R_{\text{loss}}$$

[Open Calculator !\[\]\(0d5ec72f61334709c3fc9450209b754f_img.jpg\)](#)

$$\text{ex } 90.8\text{kg/m}^2 = 100\text{kg/m}^2 - 9.21/\text{s}$$

8) Population Count by IPAT Equation

$$\text{fx } P = \frac{I}{A \cdot T}$$

[Open Calculator !\[\]\(b64b40baaee5acddc1eab8538ba84754_img.jpg\)](#)

$$\text{ex } 10 = \frac{1000}{20 \cdot 5}$$


9) Residence Time of Gas

$$\text{fx } T_{\text{residence}} = \frac{M}{F}$$

[Open Calculator !\[\]\(aff7c69c44a5e015f18c35867ef3f5c3_img.jpg\)](#)

$$\text{ex } 3.166667\text{s} = \frac{19\text{kg}}{6.0\text{kg/s}}$$



10) Technology Count by IPAT Equation 

$$\text{fx } T = \frac{I}{A \cdot P}$$

[Open Calculator](#) 

$$\text{ex } 5 = \frac{1000}{20 \cdot 10}$$



Variables Used






- **A** Affluence
- **a'** Attack Rate of Predator
- **c** Conversion Efficiency into Offspring
- **D_{biomass}** Gross Decrease in Biomass (*Biomass Kilogram per Square Meter*)
- **dNdt** Instantaneous Growth Rates of Prey
- **dPdt** Instantaneous Growth Rates of Predator
- **F** Total Average Influx or Outflux (*Kilogram per Second*)
- **f_c** Fraction of Communicative Planets
- **f_i** Fraction of Life Sites where Intelligence Develops
- **f_l** Fraction of Earth sized Planets where Life Grows
- **f_p** Fraction of Those Stars with Planets
- **I** Human Impact on Environment
- **I_{biomass}** Gross Primary Production (*Biomass Kilogram per Square Meter*)
- **L** Lifetime of Communicating Civilizations
- **M** Average Mass in Atmosphere (*Kilogram*)
- **N** Number of Prey
- **N_{biomass}** Net Biomass (*Biomass Kilogram per Square Meter*)
- **N_{civilization}** Number of Communicative Civilizations
- **n_e** Number of Earth-sized Worlds per Planetary System
- **N_{P/C}** Number of Predators or Consumers
- **NPP** Net Primary Production (*Biomass Kilogram per Square Meter*)



- **P** Population
- **q** Predator or Consumer Mortality Rate
- **r** Growth Rate of Prey
- **R** Rate of Formation of Suitable Stars
- **R_{loss}** Respiratory Loss (*1 Per Second*)
- **T** Technology
- **T_{residence}** Residence Time of Gas (*Second*)







Constants, Functions, Measurements used

- **Measurement: Weight** in Kilogram (kg)
Weight Unit Conversion 
- **Measurement: Time** in Second (s)
Time Unit Conversion 
- **Measurement: Mass Flow Rate** in Kilogram per Second (kg/s)
Mass Flow Rate Unit Conversion 
- **Measurement: Time Inverse** in 1 Per Second (1/s)
Time Inverse Unit Conversion 
- **Measurement: Biomass Scale** in Biomass Kilogram per Square Meter (kg/m²)
Biomass Scale Unit Conversion 



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