

Electromagnetic Radiation -- page 70 in CiC, spectrum of "gamma rays - x-rays - UV - visible - IR - microwave - radio"

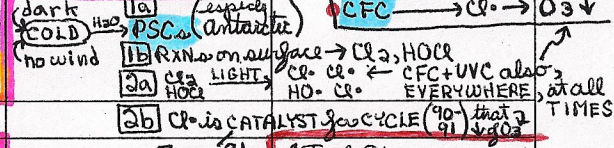
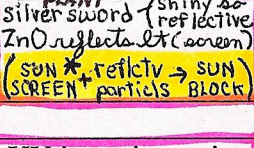
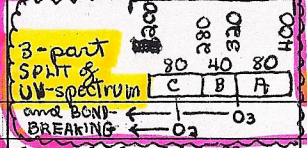
| name, λ (in nm) | γ and x | 200nm | UV-C | 280 | UV-B | 320 | UV-A | 400 | VBGYOR | 700nm | IR |
|----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|------|-----|--------|-------|----|
| RELATIVE ENERGY PHOTON % in sunshine | highest | high | medium | low | lower | lowest (MICRO WAVE) | | | | | |
| type of rxn: | IONIZING BREAKS BONDS NUCLEAR $H_2O \rightarrow H_2O^+ + e^-$ OFF | BREAKS BOND $O_2 \rightarrow 2O$ $O_3 \rightarrow O_2 + O$ | BREAKS BOND $O_3 \rightarrow O_2 + O$ | BREAKS BOND $O_3 \rightarrow O_2 + O$ | USUALLY NO RXN NaO $NO + O$ | later, "greenhouse" EFFECT absorbs IR (CO_2 ...) | | | | | |
| reaction(s) including any non-chemicals, over-the-arrow: | $O_2 \rightarrow 2O$ $O_3 \rightarrow O_2 + O$ | $O_2 \rightarrow 2O$ $O_3 \rightarrow O_2 + O$ | $O_3 \rightarrow O_2 + O$ | $O_3 \rightarrow O_2 + O$ | $Cl_2 \rightarrow 2Cl$ $NO + O$ | but $O_2, Na(\dots)$ don't | | | | | |
| rxn's location & non-location | | in STRATOSPHERE, not TROPOSPHERE | STRATOSPHERE | TROPOSPHERE | STRATOSPHERE | STRATOSPHERE | | | | | |
| skin-effects | (earlier) for Exam 1, hands of early radiologists (who didn't know the danger) | causes sun-BURN | causes sun-TAN | causes sun-TAN | causes sun-TAN | causes sun-TAN | | | | | |
| cancer-effects | (earlier) - IONIZ-RXNS $\rightarrow H_2O^+, OH^+$ that damage DNA, \rightarrow cell death (RADN SICKNESSES) | SKIN cancers: basal cell carcinoma (common), squamous cell (outer layer), melanoma (75% die) | SKIN cancers: basal cell carcinoma (common), squamous cell (outer layer), melanoma (75% die) | SKIN cancers: basal cell carcinoma (common), squamous cell (outer layer), melanoma (75% die) | SKIN cancers: basal cell carcinoma (common), squamous cell (outer layer), melanoma (75% die) | SKIN cancers: basal cell carcinoma (common), squamous cell (outer layer), melanoma (75% die) | | | | | |
| eye-effects | damaged DNA cell (lives on as cancer) | damage eye-STRUCTURE (cornea, lens) | burns eye-SURFACE | burns eye-SURFACE | burns eye-SURFACE | burns eye-SURFACE | | | | | |
| miscellaneous HEALTH HAZARDS | acid LUNGS, NO ₂ , etc | | | | | | | | | | |
| SPECTROPHOTOMETER | GRAPH | | | | | | | | | | |
| light can be | in fluorescence, ACE | metric prefixes | how do health-effects | UV intensity varies | | | | | | | |
| reflected | light is absorbed, loses some energy (converted to HEAT) and then emission; | what (UV, vis) goes thru quartz & glass? | of UV-B,A depend on dark skin color (melanin), men/women (why?) | w altd lald (HOLE...) | | | | | | | |
| absorbed | | | | | | | | | | | |
| emitted | | | | | | | | | | | |
| transmitted | | | | | | | | | | | |
| Is it a radical? | optical brightener | both transmit thru QRTZ but UV stopped by GLASS (absorbed) | CRITICAL THINKING: all of these are same CONNECTIVITY. | | | | | | | | |
| K yes, K+ no | abs 350, emit 430 | | | | | | | | | | |
| H ₂ O no, H ₂ O+ Y | Why does it "undo the dinginess"? | | | | | | | | | | |
| Cl Y, Cl ₂ no | | | | | | | | | | | |
| O ₂ no, O ₂ Y | | | | | | | | | | | |
| NO ₂ Y? SO ₂ no | | | | | | | | | | | |
| OH no, OH+ Y | | | | | | | | | | | |

HEALTH EFFECTS

STRETCH BEND

I.R.

GRAPH LIGHT INTENSITY AT λ vs WAVELENGTH



metric prefixes: kilo, centi, milli, micro, nano, pico, femto, atto, zepto, yocto

what (UV, vis) goes thru quartz & glass? (≠ nuclear penetration)

how do health-effects of UV-B,A depend on dark skin color (melanin), men/women (why?)

UV intensity varies w altd lald (HOLE...)

lots of O₃ + O₂ (more than O₂) OZONE LAYER (above 15-30 km)

optical brightener: Why does it "undo the dinginess"? It adds back the blue (hi-en part of vis spectrum) that is absorbed by dyes (initially white-planching) (WHITE = all vis-color) reflected or emitted by source

FORMULAS: chemical, condensed structural, structural, Lewis (= structural with el dots on all but C,H)

CRITICAL THINKING: all of these are same CONNECTIVITY. FORMULAS: chemical, condensed structural, structural, Lewis (= structural with el dots on all but C,H)

both some pentane

use BOND-NEEDS for most (C,H,N,O,F,Cl) but not O₃, SO₂, SO₃, NO₂, NO, NO₂ (all have one O=) CO (=N₂) C≡O but poison, dx

chlorines: Cl, Cl₂ chlorides: Cl⁻ chloro: -Cl

methane: mono, di, tri, tetra

more detail: CH₃CH₂CH₂OH

geometry pentagon...

free radicals (like NO, NO₂) very reactive

naming CFC, HCFC...