

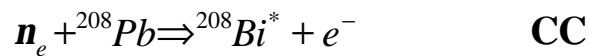
LEAD PERCHLORATE

AS A

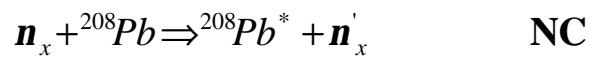
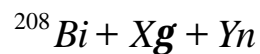
NEUTRINO DETECTION MEDIUM

LEAD IS AN EXCELLENT NEUTRINO TARGET:

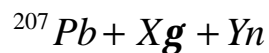
- ◆ HIGH CROSS SECTION
- ◆ RELATIVELY LOW COST
- ◆ CC AND NC REACTIONS



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DETECTOR SHOULD BE SENSITIVE TO:

- ◆ CHARGED PARTICLES
- ◆ NEUTRONS
- ◆ GAMMA RAYS

LEAD PERCHLORATE $\text{Pb}(\text{ClO}_4)_2$ IS:

◆ **HIGHLY SOLUBLE**

500gm $\text{Pb}(\text{ClO}_4)_2/100\text{gm H}_2\text{O}$

Density = 2.7 @ 80% Conc.

◆ **CONTAINS CHLORINE**

Neutron Capture on Cl \Rightarrow 8.4 MeV γ 's

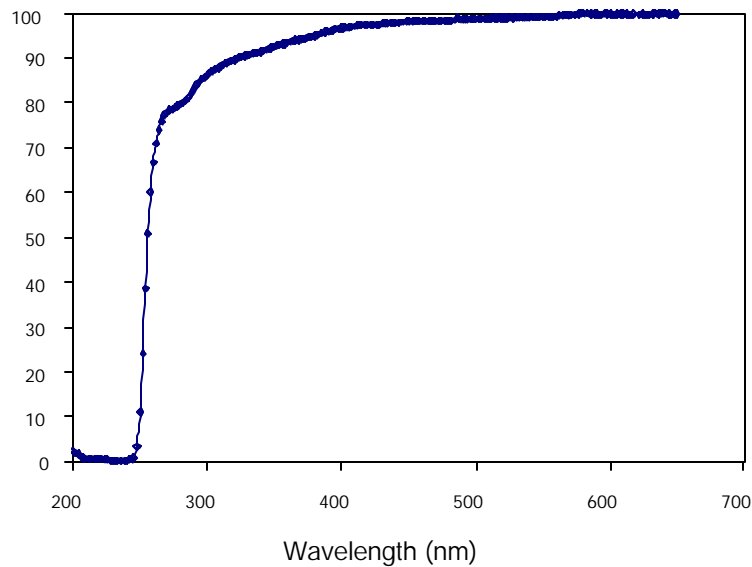
^{35}Cl n capture cross section 44.0b

◆ **RELATIVELY INEXPENSIVE**

\approx \$10k/Tonne (\geq 100 tonne @ 80% conc.)

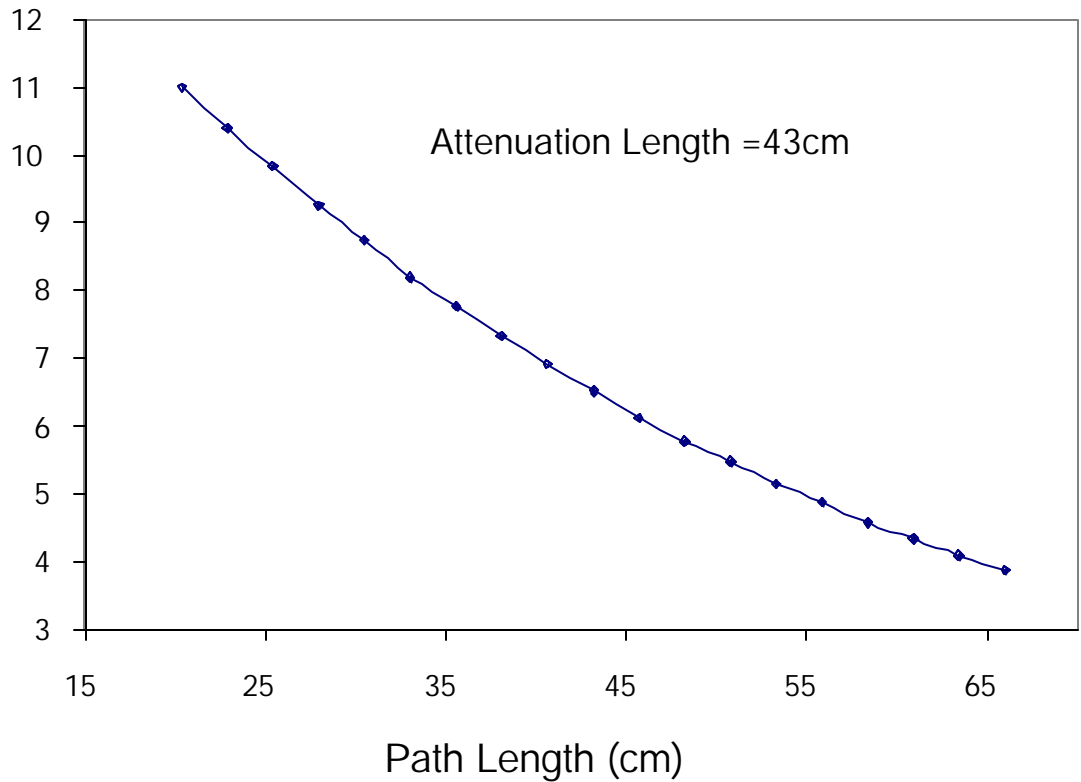
◆ **APPEARS TRANSPARENT**

Refractive Index = 1.5 @ 80% Conc.



SPECTRAL TRANSMISSION THROUGH 1cm 80% $\text{Pb}(\text{ClO}_4)_2$
(REFERENCED TO H_2O)

IS IT POSSIBLE TO MAKE
A
LARGE CERENKOV DETECTOR?



Attenuation length of 430nm light in 80% $\text{Pb}(\text{ClO}_4)_2$ (Unpurified)

- ◆ Is light loss due to Scattering from Pb salts or polymeric molecules such as $\text{Pb}_4(\text{OH})_4$ resulting from reactions with O^2 and CO^2 ?
- ◆ Can the liquid be purified in large quantities?