Overexpression of ICL

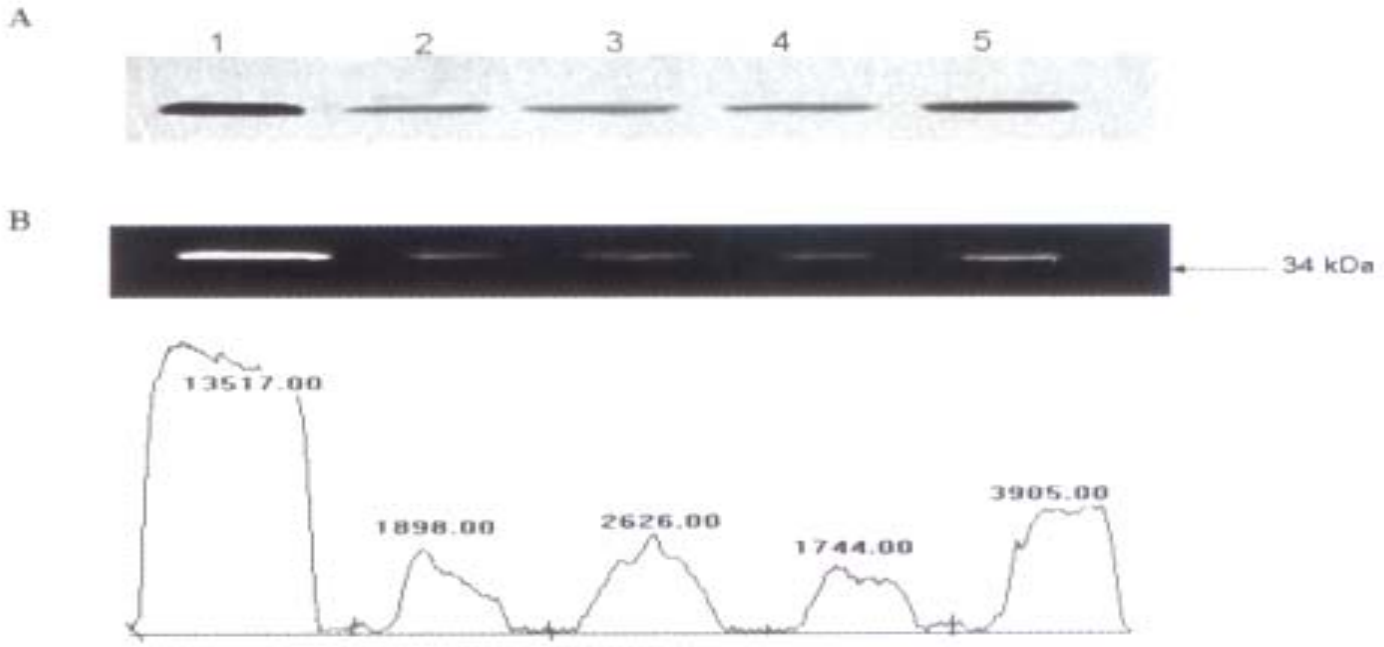
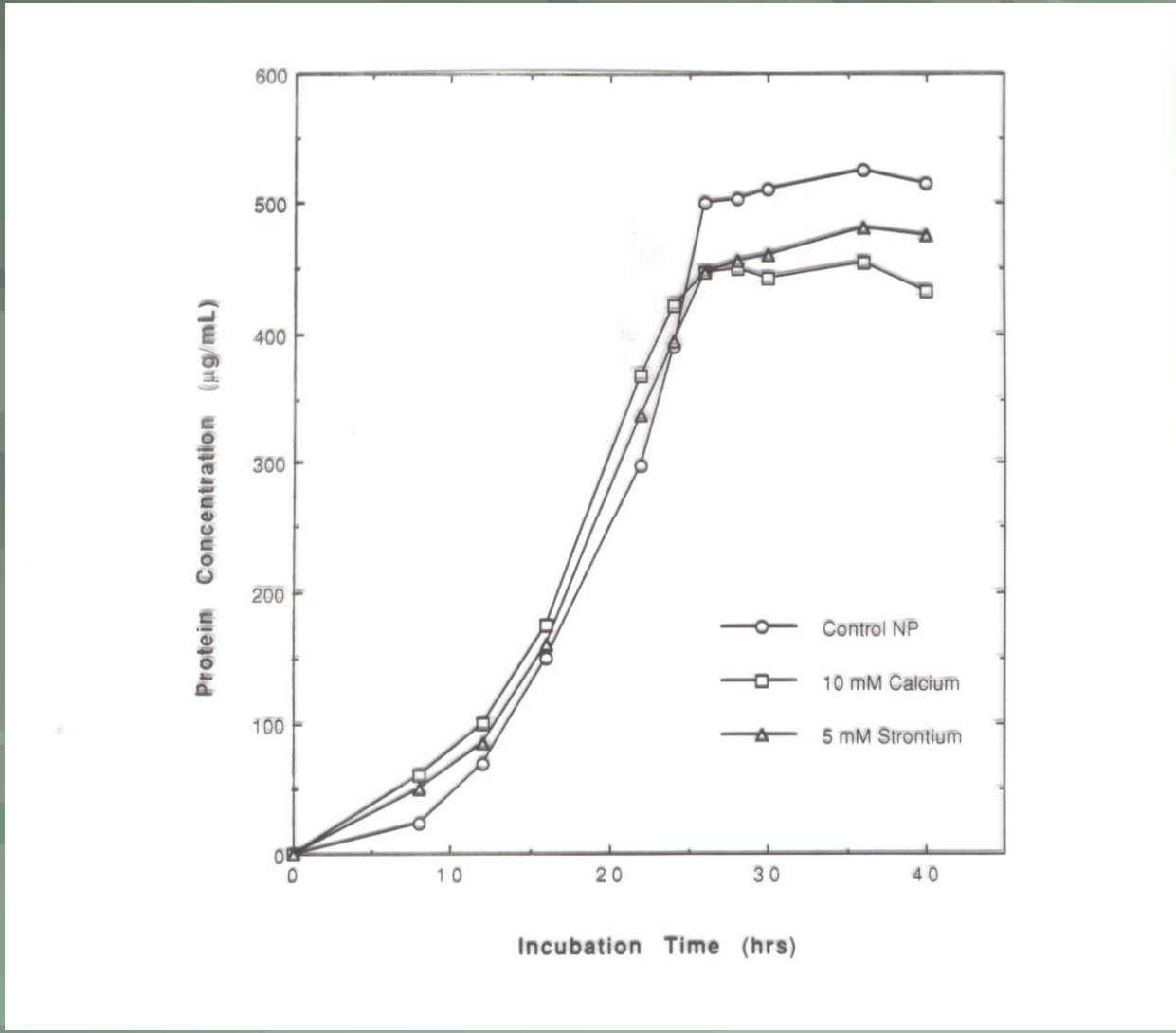
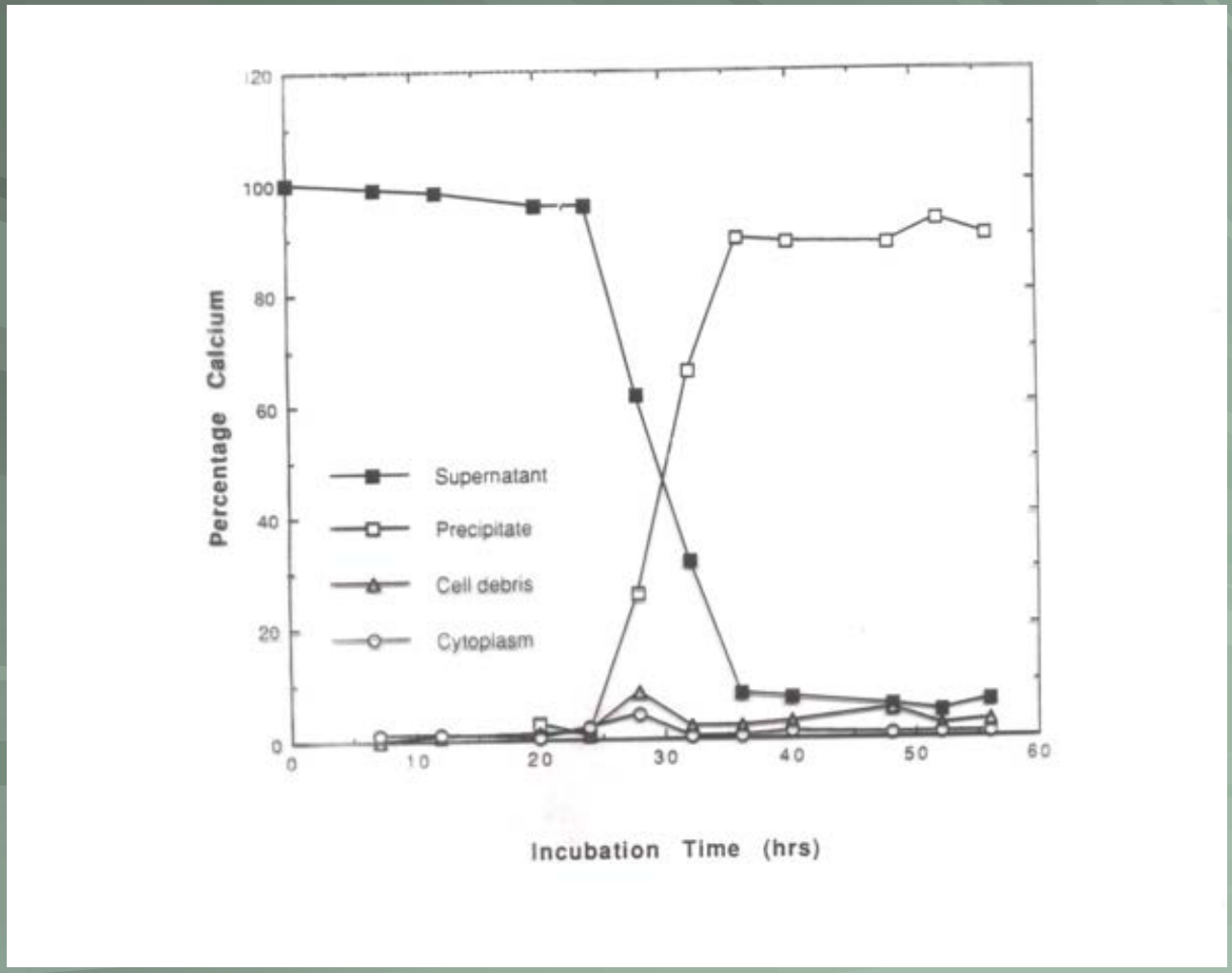


FIG. 7. **Influence of aluminum on ICL activity and protein levels.** *A*, activity stain of soluble CFE for ICL on BN-PAGE is shown. *B*, immunoblot for ICL using SDS-PAGE. *Lane 1*, cells from aluminum citrate medium; *lane 2*, cells from *1* incubated for 4 h in media devoid of aluminum (control media); *lane 3*, cells from *lane 2* incubated (6 h) in fresh aluminum citrate media containing rifampicin (200 μg/ml); *lane 4*, cells from *lane 2* incubated (6 h) in fresh aluminum citrate media containing chloramphenicol (200 μg/ml); *lane 5*, cells from *lane 2* incubated (6 h) in fresh aluminum citrate media devoid of protein synthesis inhibitors. Immunoblot band intensities were measured using SCION image software.

Growth profile of ***P.fluorescens*** in Ca medium

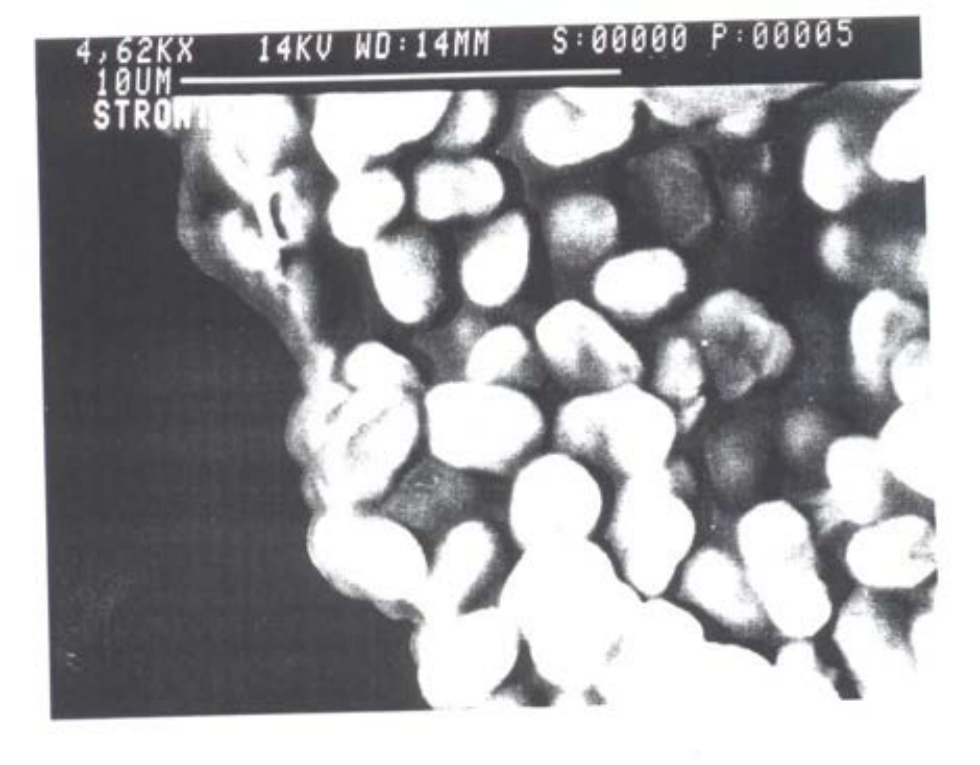


Metabolism of Ca in ***P.fluorescens***



Electron micrograph of exocellular Calcite

Biomineralization of Strontianite



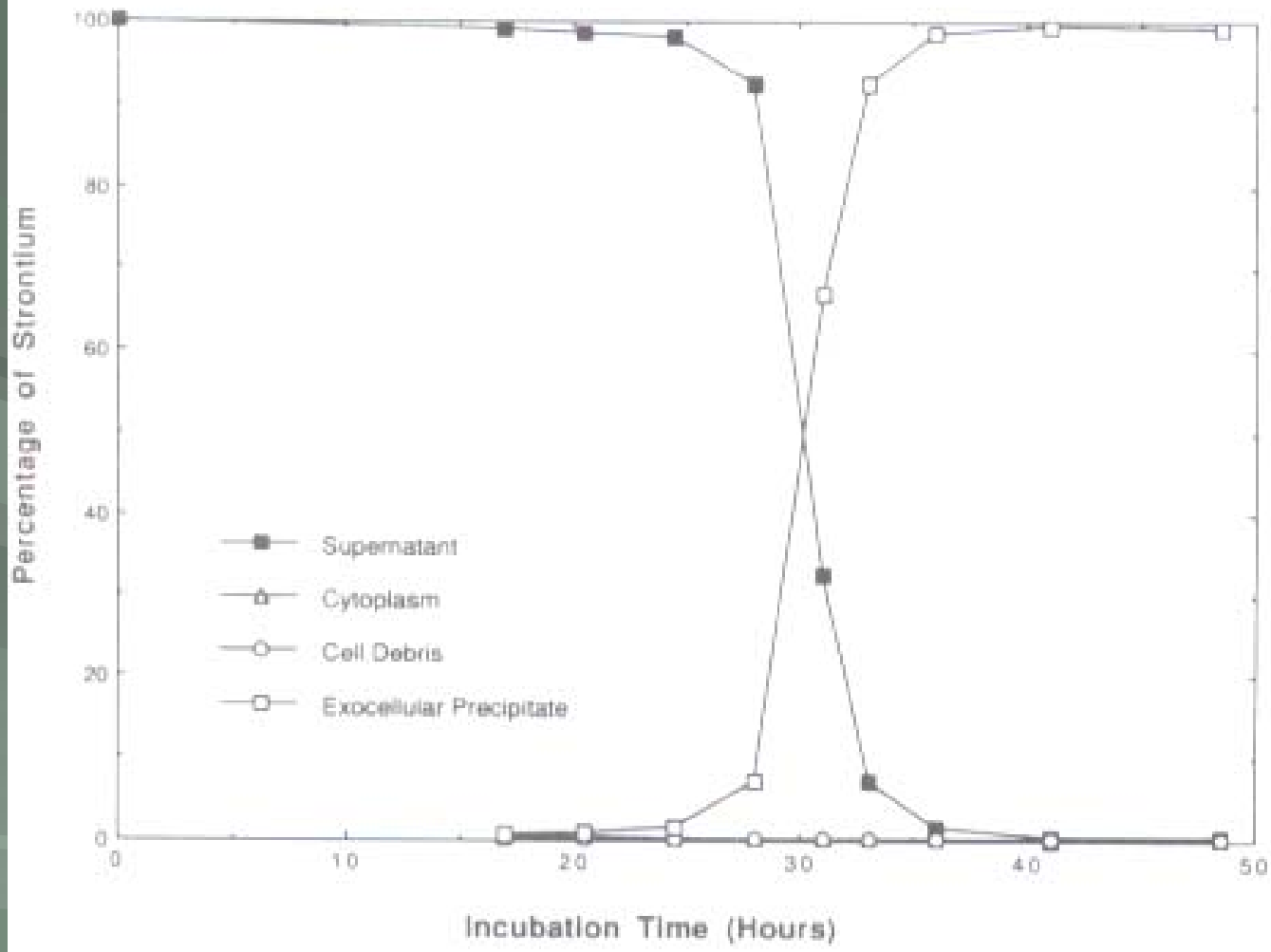
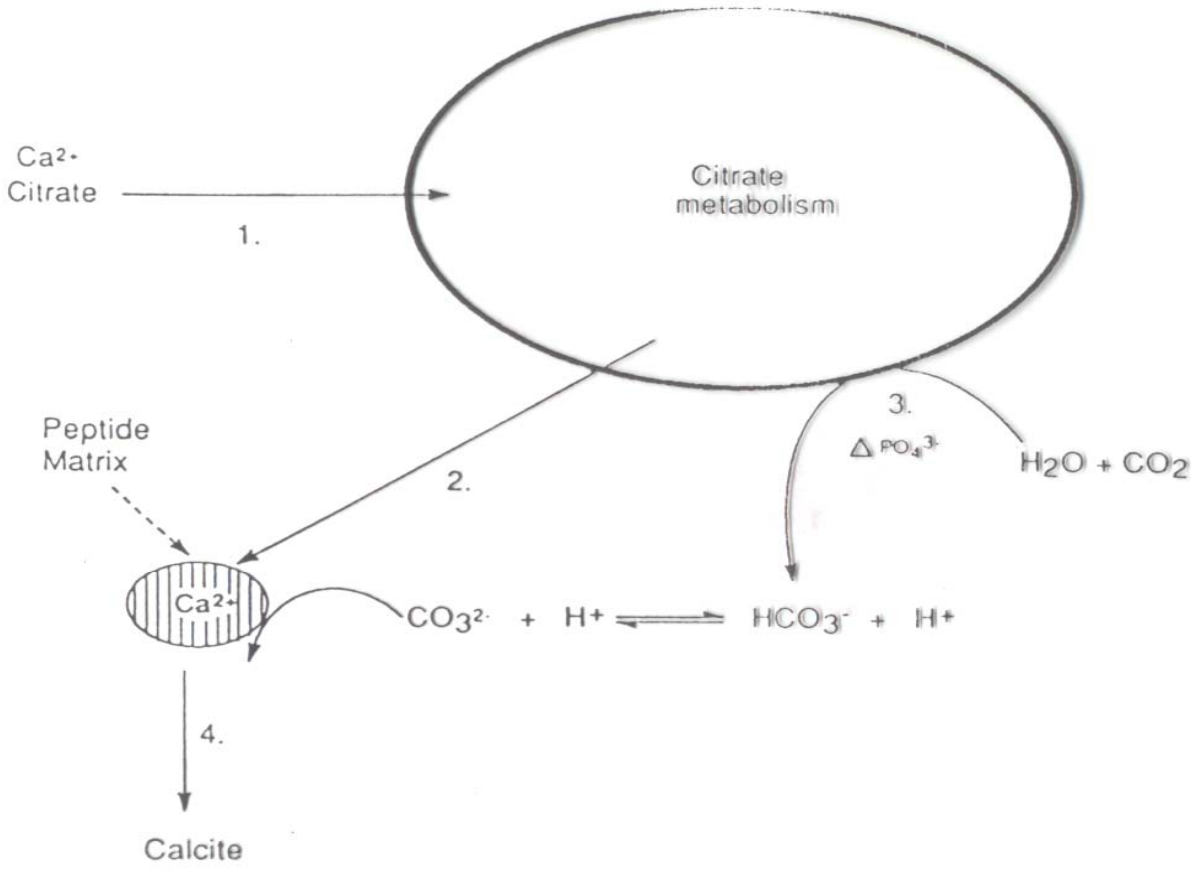


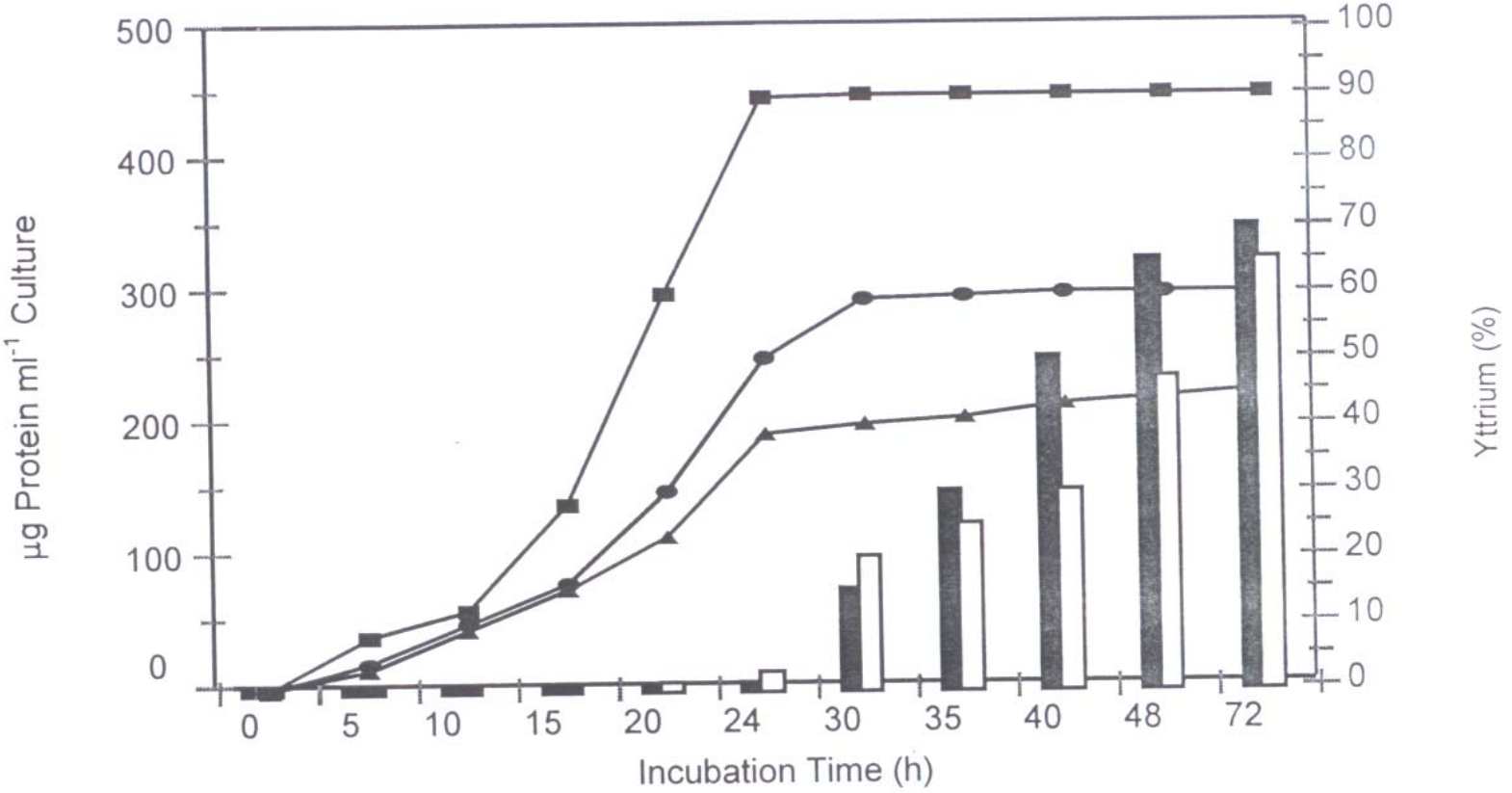
Fig. 2. Strontium metabolism in *Pseudomonas fluorescens* as analyzed by atomic absorption spectrophotometry.

Formation of Calcite

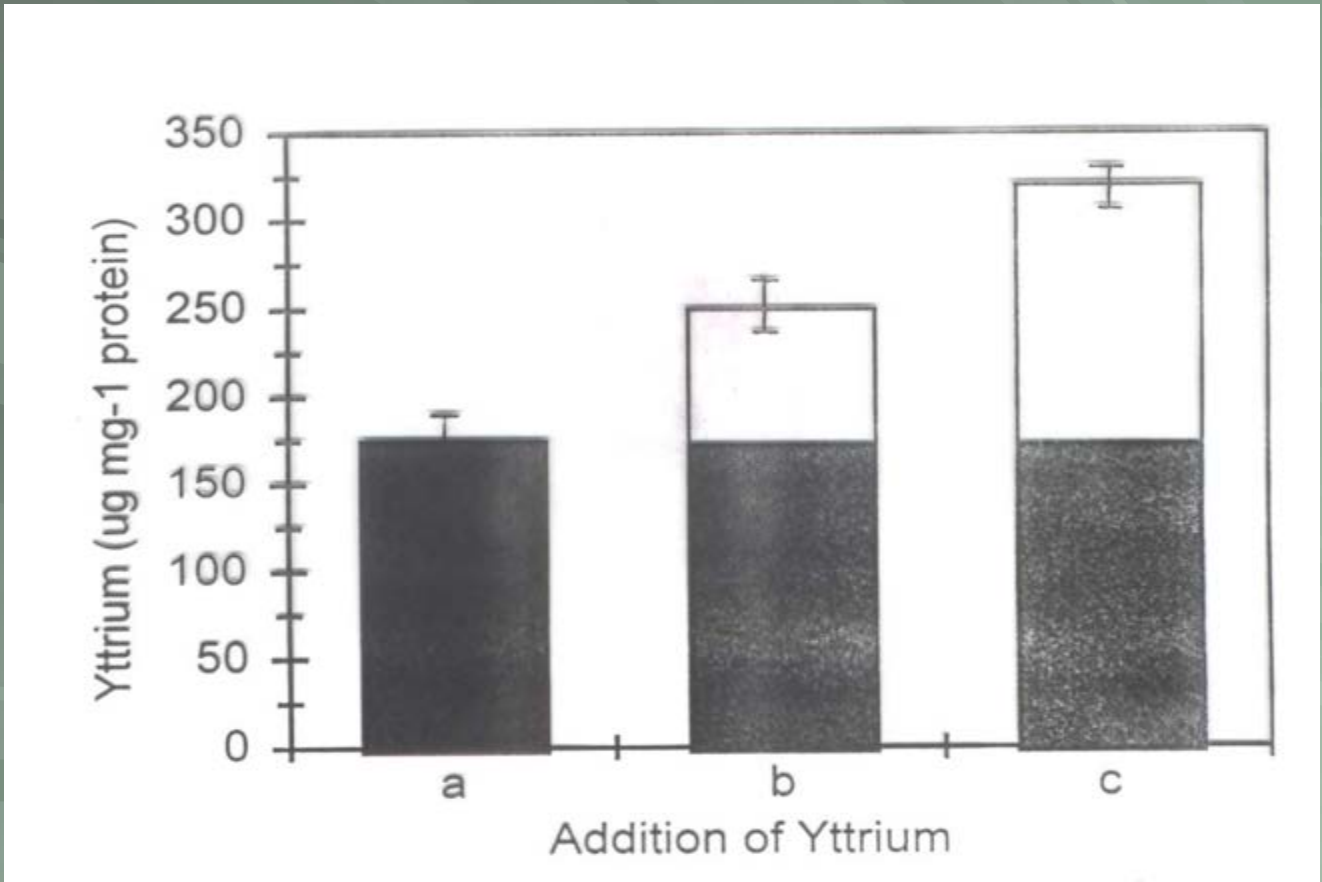


1. Ca^{2+}-citrate metabolism
2. Initial sequestration of Ca^{2+} in the peptide matrix
3. CO_2 fixation : modulated by PO_4^{3-}
4. Calcite formation

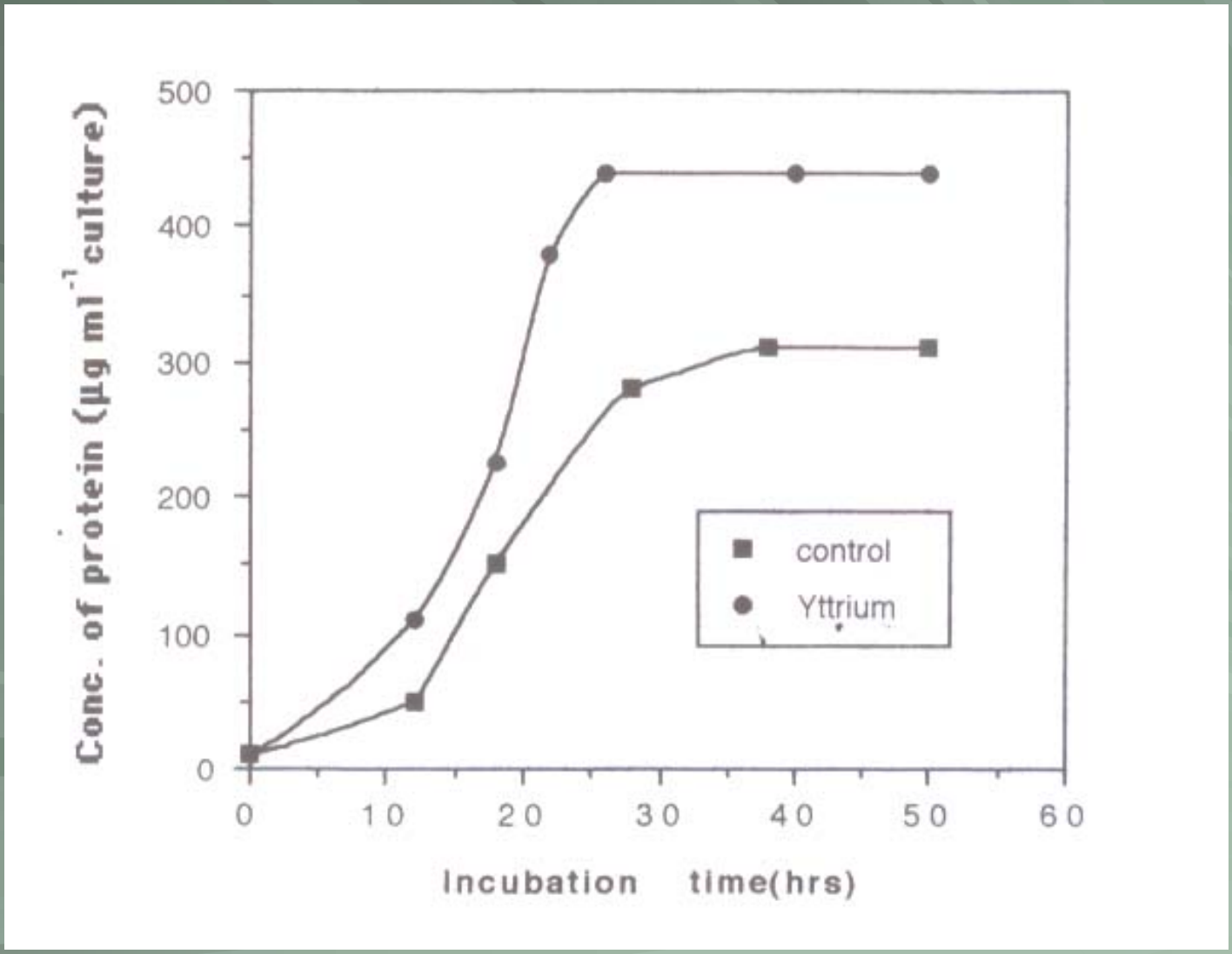
Growth and Accumulation of Yttrium in ***P.fluorescens***.



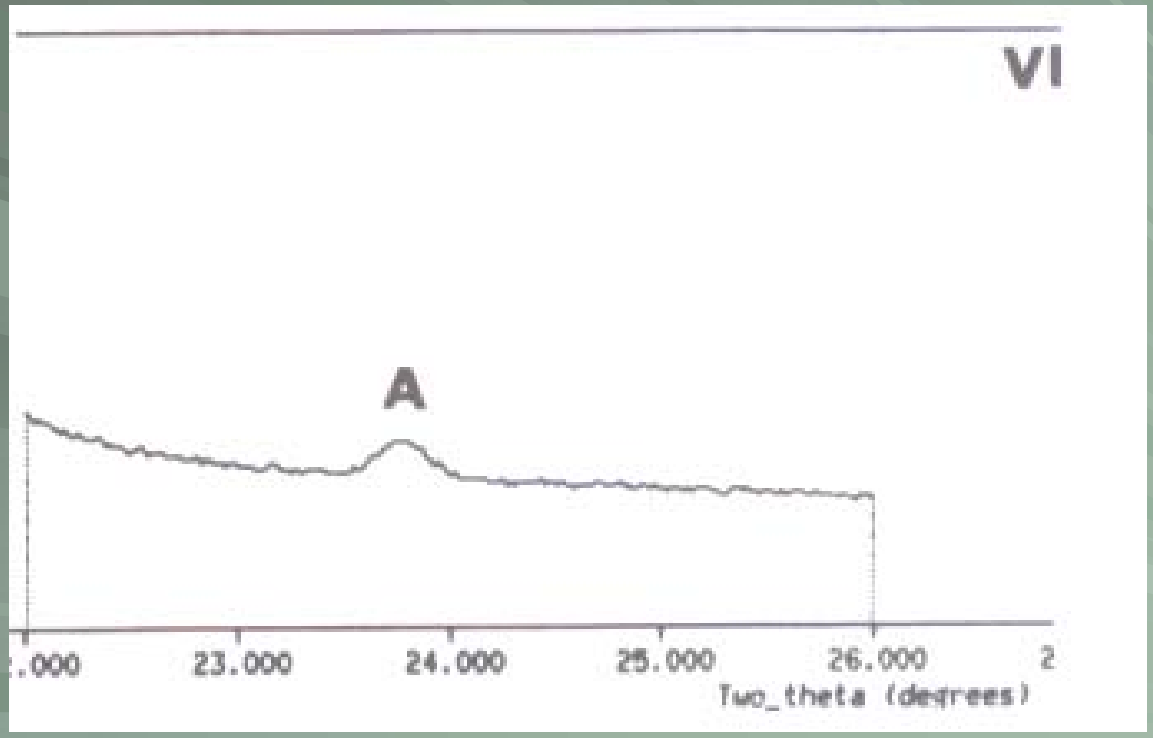
Accumulation of Yttrium in outer membrane fraction



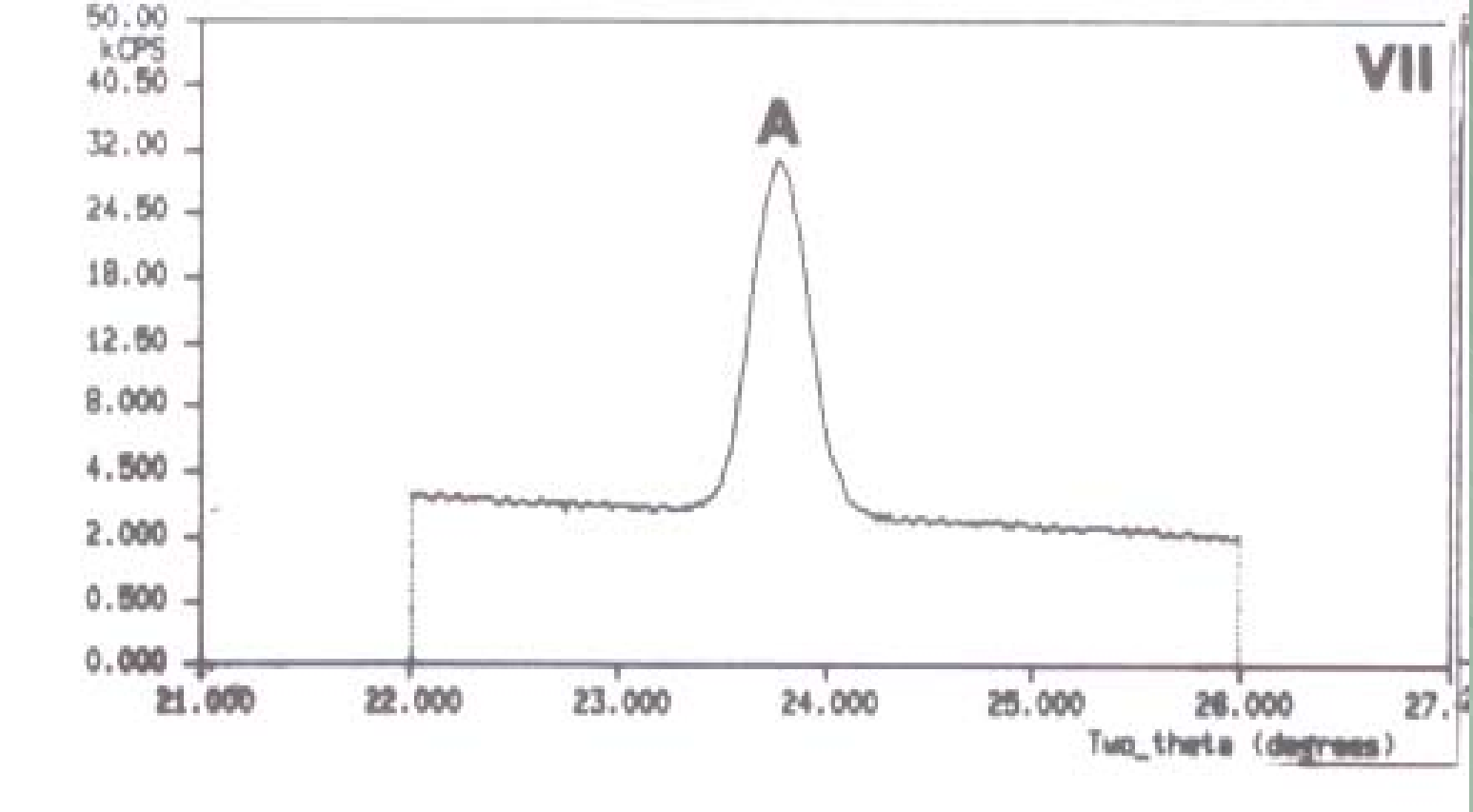
Yttrium and cellular yield



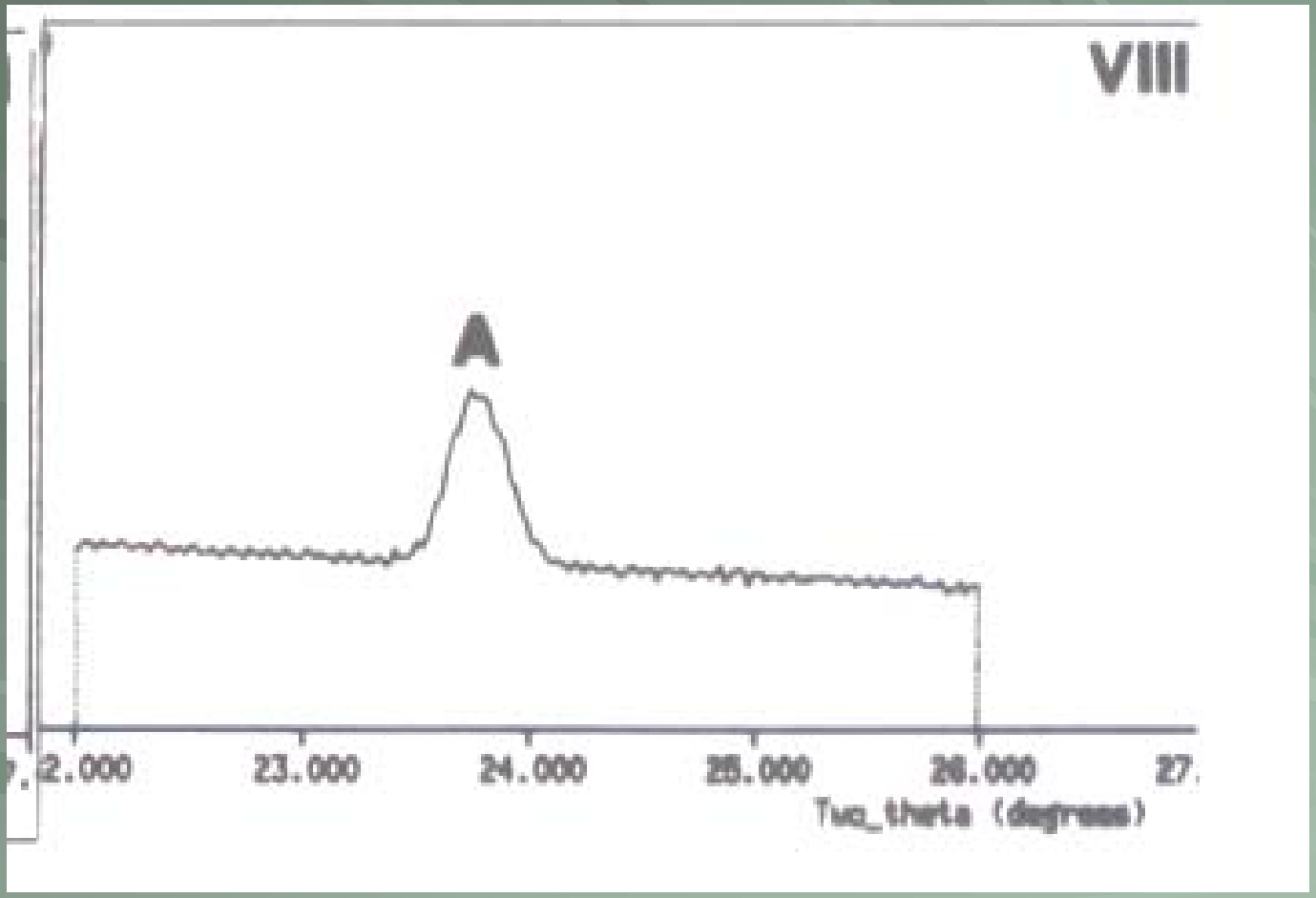
Yttrium in Spent Fluid



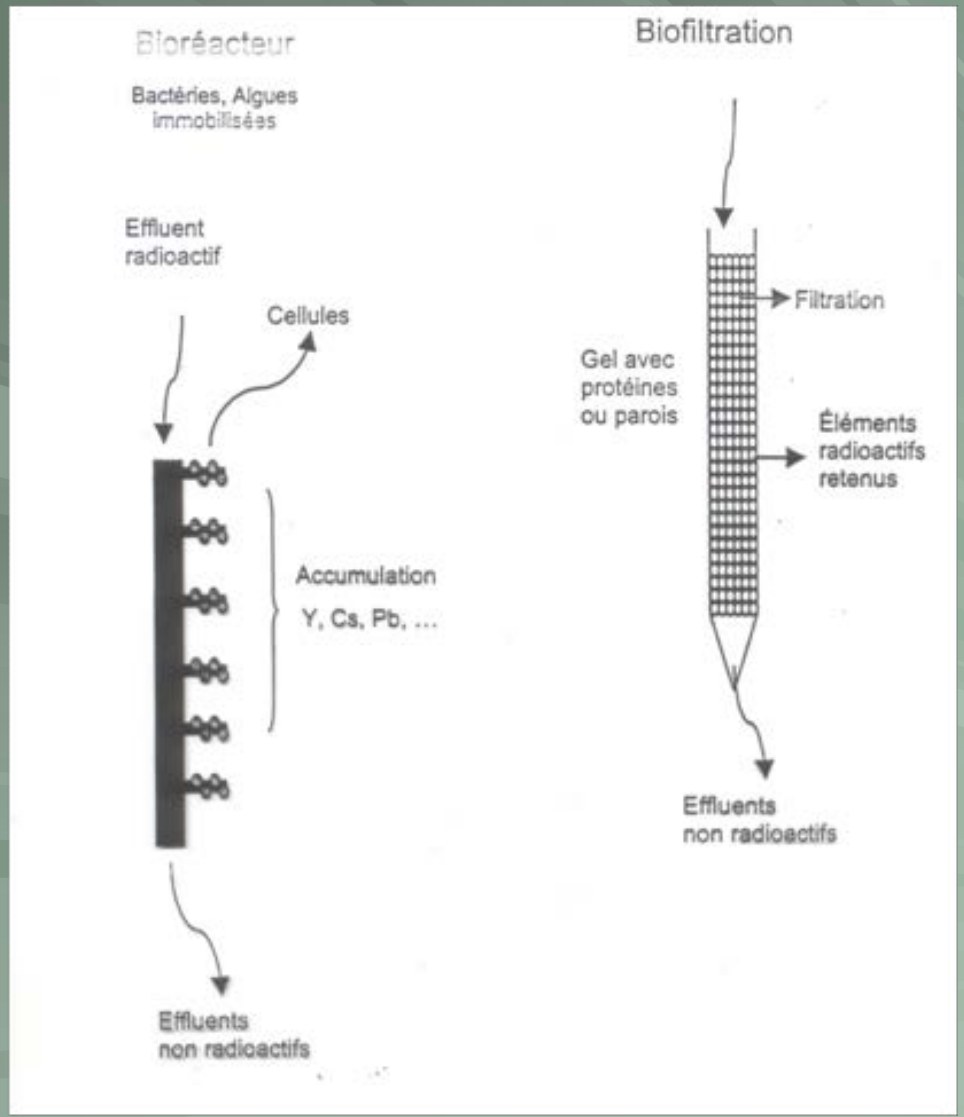
Yttrium in Cells



Yttrium in Pellet



Model Bioreactor



Pb stress in ***P. fluorescens***

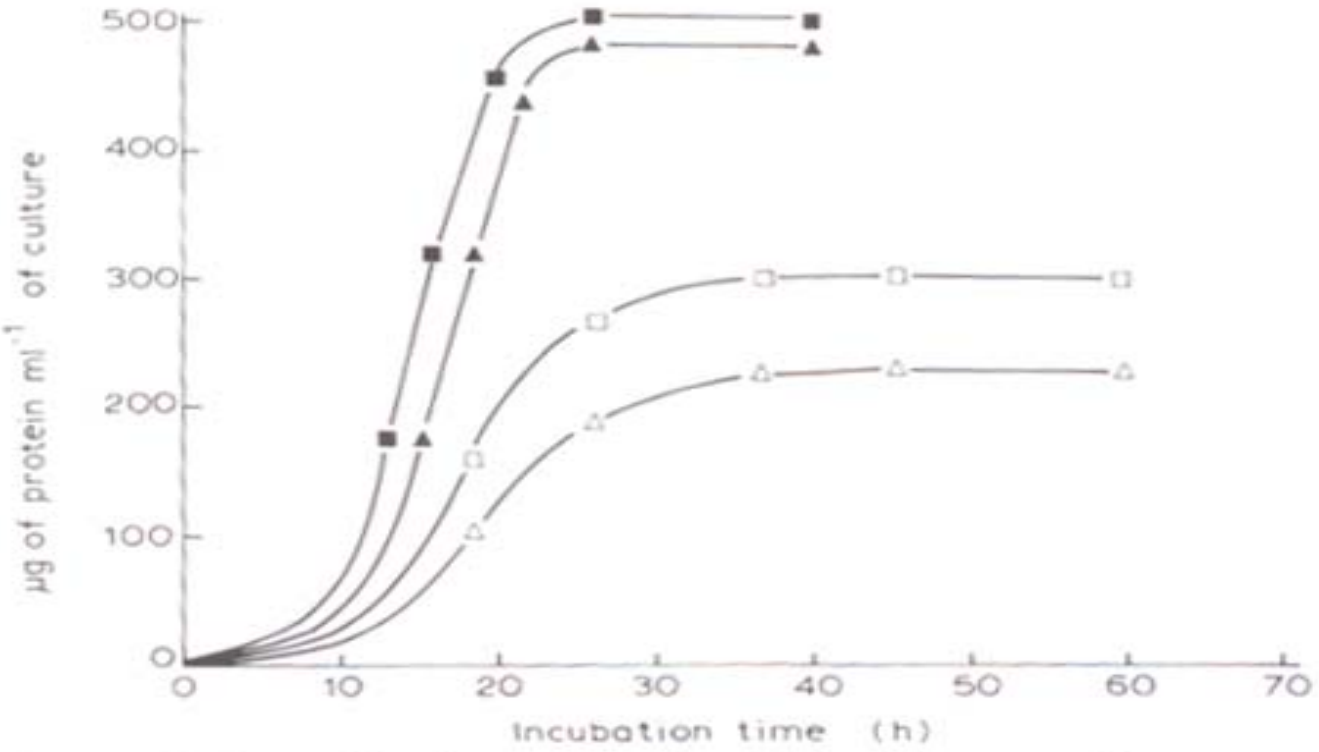
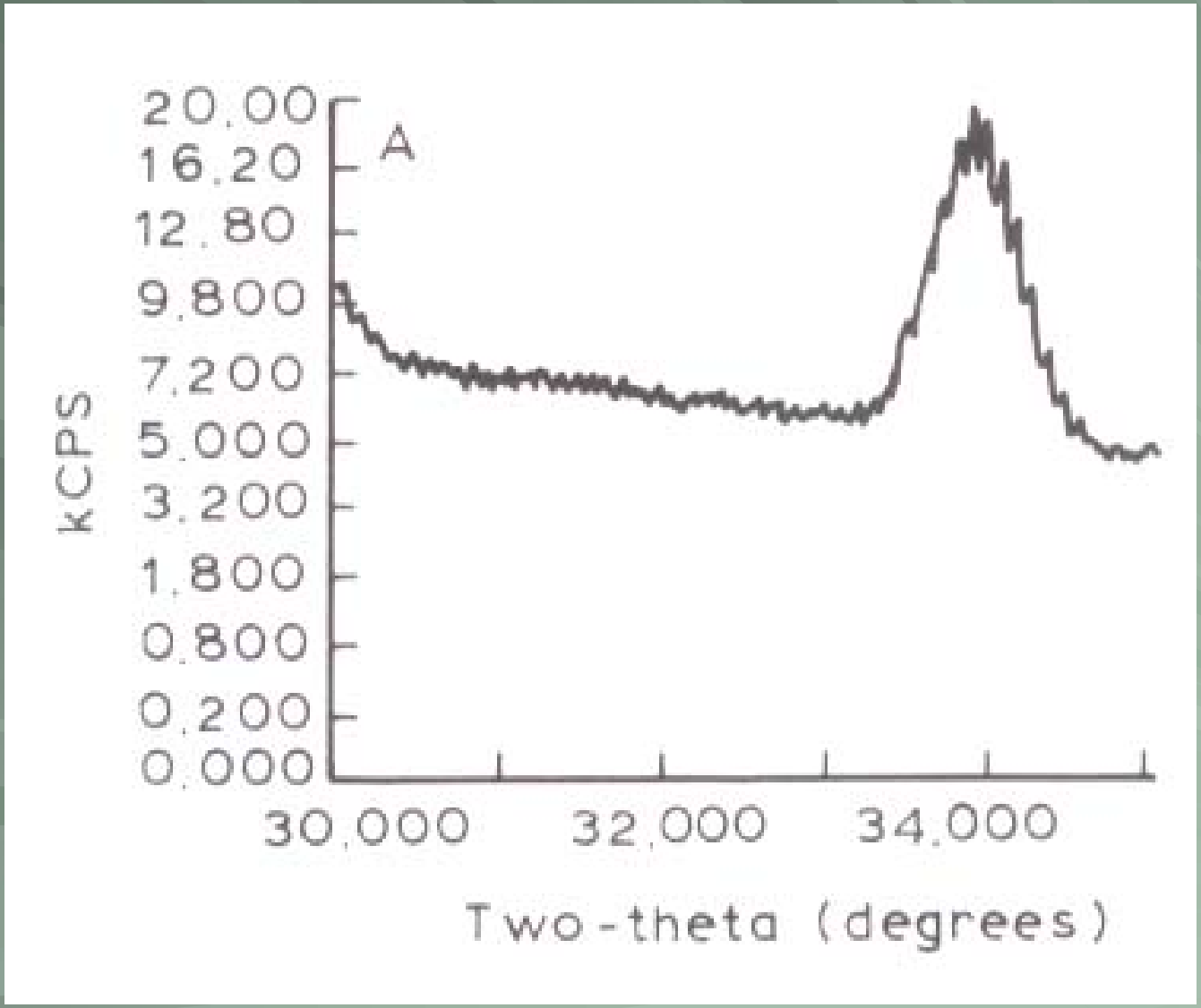
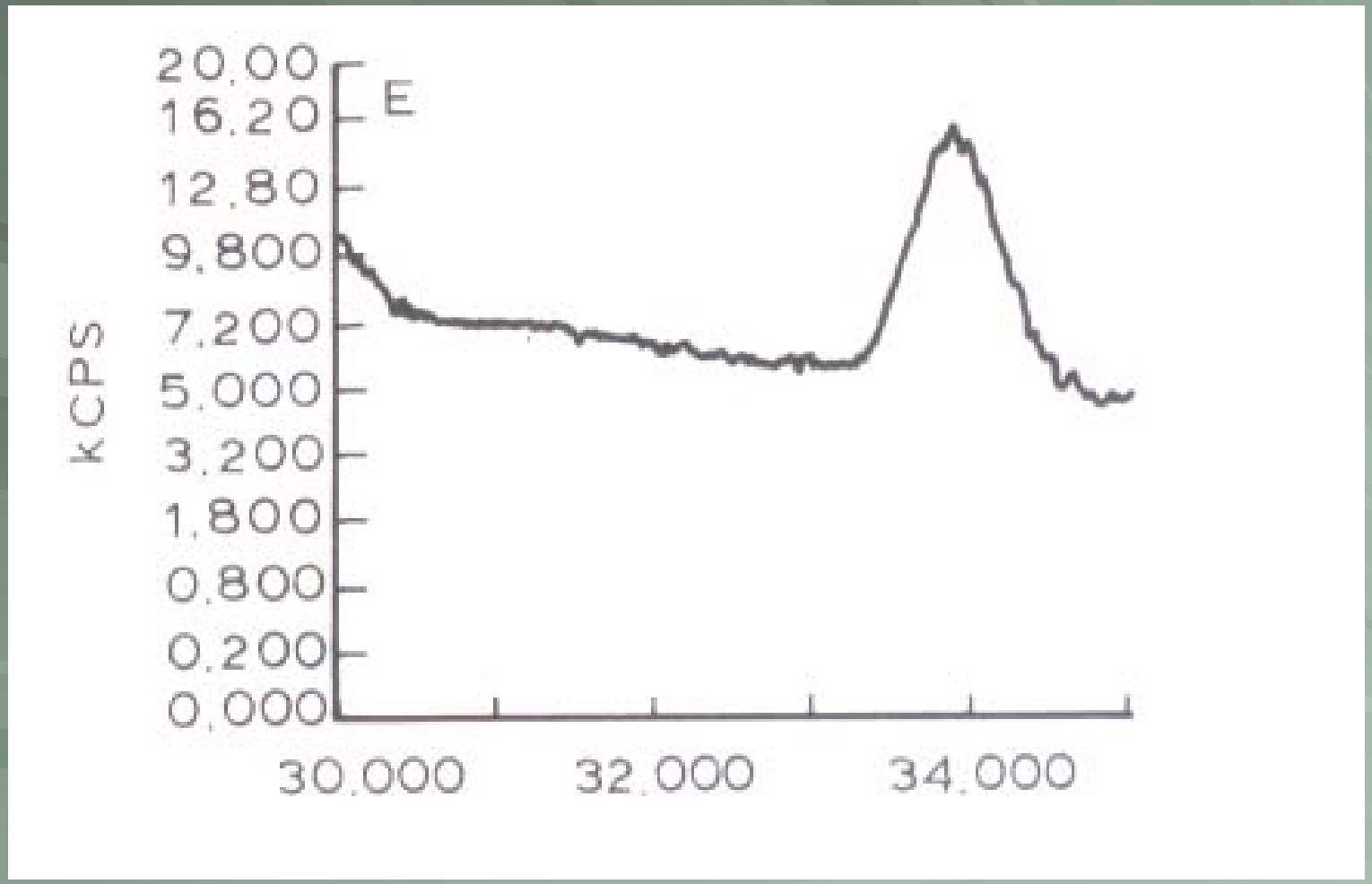


Fig. 1. Effect of lead on growth of *Pseudomonas fluorescens ATCC 13525*. ■ ——— ■ Phosphate-rich medium unamended with test metal. ▲ ——— ▲ Phosphate-rich medium supplemented with 0.1 mM lead. □ ——— □ Phosphate-deficient medium without test metal. △ ——— △ Phosphate-deficient medium enriched with 0.1 mM lead.

Pb in medium


20.00
16.20
12.80
9.800
7.200
5.000
3.200
1.800
0.800
0.200
0.000
kCPS
A
30.000
32.000
34.000
Two-theta (degrees)

Pb in Insoluble Pellet



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- V.D. Appanna , M. Rauh , R. Hamel and E. Gauthier (1997) Isolation and characterization of an aluminum sensitive mutant of *Pseudomonas fluorescens* . *FEMS Microbiol . letts* 152 : 287-292

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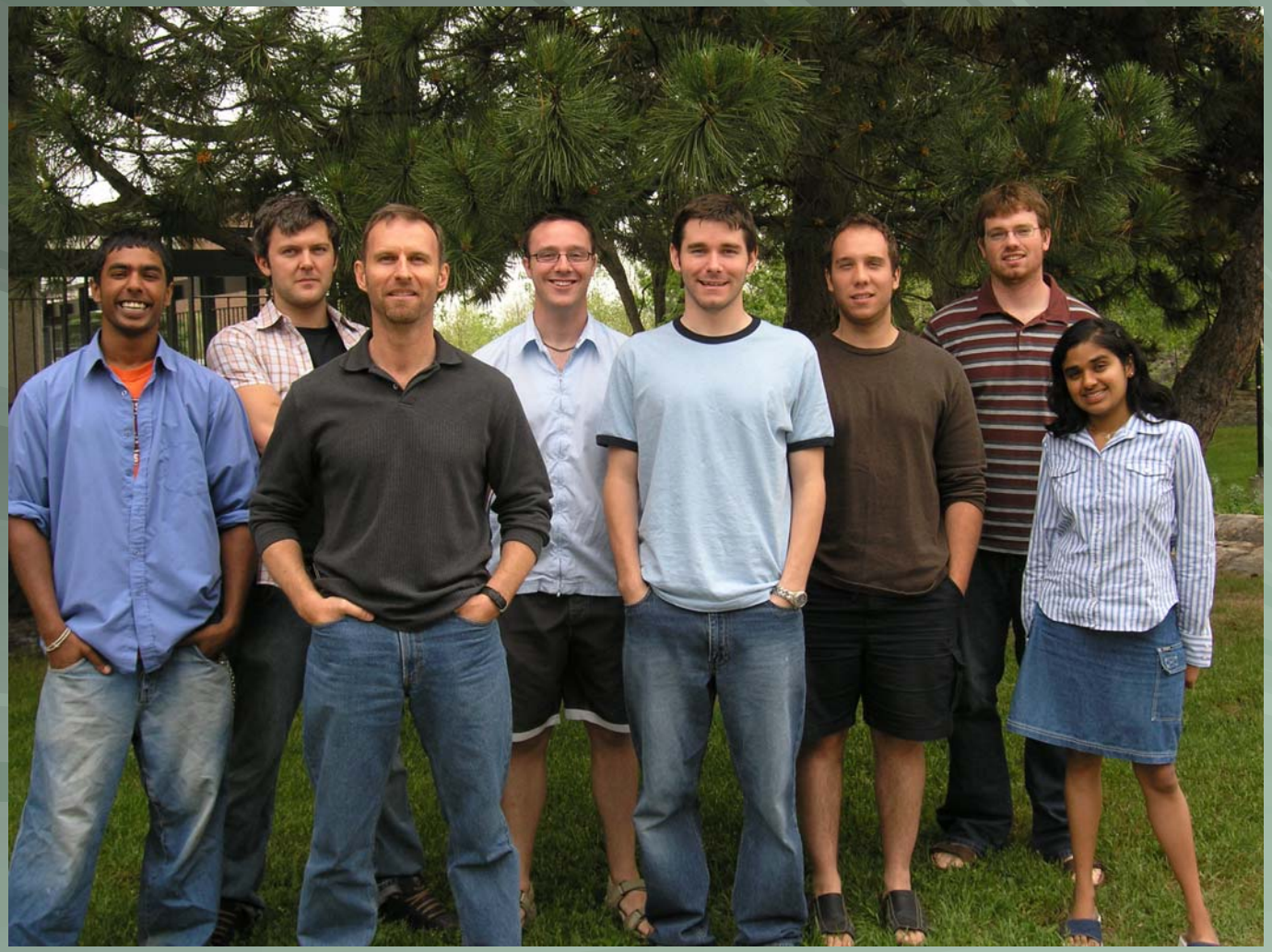
Conclusion

- ***Pseudomonas fluorescens*** is an excellent organism for the decontamination of metal pollutants
- It insolubilizes Al,Ca,Pb,Fe
- It accumulates Y
- It may be also be utilized for commercial production of enzymes ex: ICL, ME, IDH

Acknowledgements



Tourism