LE VERRE FLUORÉ
FIBER SOLUTIONS

The serependious discovery of heavy metal fluoride glasses was the starting point of an extraordinary adventure. It took place in 1974 at Rennes University. The two brothers Michel and Marcel Poulain, researchers in the solid state chemistry department, were investigating new fluoride complexes based on zirconium fluoride. The synthesis process encompassed heating metallic sealed tubes and quenching to stabilize high temperature phases.
When opening the nickel tube, they first observed large crystals that later turned to be amorphous. An amorphous crystal… that was a glass ! This happy accident would have hudge consequences on glass science and technological developments. A first paper was published in 1975, and gradually research effort moved from crystalline materials to these new glasses. Encouraged by Jacques Lucas, the head of the Laboratory, Marcel Poulain developed a new synthesis route using open platinum crucible and in situ fluorination by ammonium fluoride. This reduced synthesis time from 15 hours to less than 30 minutes, while increasing batch size. With PhD students, chemical compositions were systematicly investigated to define optimum glass forming ranges. The stabilizing effect of aluminum fluoride emerged as a key feature, and rapidly enough the ZBLAN glass composition was identified.

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