Fluoride glass waveguides buried by reversed ionic exchange process

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Fluoride glass channel waveguides have been prepared by means of ionic exchange and photolithography. The high-refractive-index region of the guiding structure was obtained by substituting chloride for fluoride ions in ZrF_4-BaF_2-LaF_3-AlF_3 glass. Thanks to the reversible nature of the process, the fluorine network could be rebuilt at the glass surface, which resulted in the burial of the waveguide. Buried planar and channel waveguides were characterized by near-field analysis and optical loss measurements.