In this thesis we study the discrete maximum principle for a diffusion-reaction problem solved by means of various types of nite elements. The work includes the brief characterization of the problem and of the nite element method, de nition of the discrete maximum principle and general conditions for its validity. The main focus of this work is in the analysis of such geometric conditions for the shape and possibly also for the size of the speci c nite elements that guarantee the validity of the discrete maximum principle. Namely, we analyze conditions for intervals, triangles, rectangles, tetrahedra, blocks and triangular prisms.