Method for determining hydrogen concentration in metals of structures, in which a physical characteristic of the metal of the structure correlating with the hydrogen concentration in the metal is determined, and the hydrogen concentration in the metal of the structure is evaluated based on the determined value of the physical characteristic. Parameters of a magnetic hysteresis loop of the metal, determined by means of an external magnetic transducer, are used as the physical characteristic of the metal of the structure correlating with the hydrogen concentration in the metal. Wherein, a correlation dependence between a selected parameter of the magnetic hysteresis loop and the hydrogen concentration is pre-determined for an applied type of the magnetic transducer using samples, the material and treatment of which correspond to the metal of a controlled structure.