The objective of the multinational ACT project ELEGANCY is to accelerate the realization of Europe's decarbonized energy system by exploiting synergies between CCS and H2. For designing and operating these energy systems in an ecologically and economically manner, the thermodynamic properties of the relevant CO2- and especially H2-mixtures have to be accurately known. For the calculation of thermodynamic properties, the GERG-2008 equation of state already covers most of the relevant gas mixtures, however, the addition of hydrogen often yields increased uncertainties. As a result, the GERG-2008 equation has to be further improved and extended. Against this background, the Thermodynamics Institute at Ruhr-University Bochum is currently working on improving the experimental database for gas mixtures containing hydrogen. Here, we present the results of our ongoing speed of sound measurements in selected binary gas mixtures containing hydrogen over a temperature range from (250 to 450) K at pressures up to 10 MPa. The speed of sound was determined from the measured frequency of the three lowest radial symmetric resonance modes for gases in a spherical cavity. Two spherical resonators were used for the measurements. The first one is incorporated in a separate pressure vessel and is thermostatted via a liquid bath; the second one is bolted and sealed with an equatorial flange to serve directly as a pressure vessel and is placed inside an isothermal copper shield, which is electrically heated. For both spherical cavities, the diameters were fitted as a function of temperature and pressure through calibration measurements in argon. The performance of both apparatuses was tested with measurements in pure methane. We compare our new experimental mixture data, which have a relative combined expanded uncertainty ($k = 2$) of 0.1% or less, with the GERG-2008 equation and other relevant equations of state.