This thesis discusses the problem of Soddy circles. The first chapter is devoted to the definition and history of these circles. In the following two chapters, we present constructions of Soddy circles and the formulas of their radii. The fourth chapter introduces other geometric shapes, which, like the circles, are named after the English chemist Frederick Soddy. The last sub-chapter mentions the analogy of Soddy circles in three-dimensional space. We conducted an experiment that examines the skills of high school students. Their task was to construct three circles with given centers which touch each other externally. We describe this experiment in more detail in the appendix.