Invention relates to chemical technology and can be used in the production of sodium chloride from solutions derived from natural raw materials. Method for purifying sodium chloride solution from sulfates involves mixing it with ground natural gypsum, stirring suspension and filtering precipitate, evaporating filtrate, and crystallizing sodium chloride, wherein sodium chloride solution for mixing is taken with a sulfate-ions concentration of 3.0-5.0 wt.%, stirring is carried out at a temperature of 60-100 °C for 0.5-2.0 hours, and natural gypsum and sodium chloride solution are taken in a mass ratio of 1:(10-20). The use of invention ensures the production of purified solution free of impurities from solutions after their evaporation and concentration of sulfate ions, a reduction in circulation flows, and a simplification of the process.