dehydration condensation reaction with a carboxyl group included in a substance contained in the sample, and a condensing agent of the dehydration condensation reaction; and

electrophoresing the nucleic acid in a polymer gel comprising an anionic functional group having a pKa of from 1 to 5, in which an intercalator having an anionic functional group has been inserted in said nucleic acid.

[10] The method according to claim 9, wherein

the functional group which undergoes the dehydration condensation reaction is an amino group.

[11] The method according to claim 10, wherein

the compound is ethanolamine or ethylenediamine.

[12] The method according to claim 11, wherein

the condensing agent includes at least one selected from 1-ethyl-3-(3-dimethylaminopropyl) carbodiimide hydrochloride salt, 4-(4,6-dimethoxy-1,3,5-triazin-2-yl)-4-methylmorpholinium chloride, dicyclohexylcarbodiimide and diisopylcarbodiimide.

[13] The method according to claim 9, wherein

the compound has at least

a first cationic functional group which undergoes dehydration condensation reaction with a carboxyl group and

a second cationic functional group which exists in an ionic state during the electrophoresis.

[14] The method according to claim 9, further comprising:

applying a voltage across a channel filled with a buffer so that the nucleic acid introduced at a

predetermined position in the channel is electrophoresed; and

damming the nucleic acid moving to a positive-electrode end.

[15] The method according to claim 14, wherein

a pH of the buffer is 8 or less.

[16] The method according to claim 9, wherein

the sample includes at least one of

a living body-originated sample containing at least one of throat swab, nasal swab, vaginal swab, blood, plasma, serum, tissue, tissue fragment, sputum, spinal fluid, urine, sweat, and feces; or

a sample containing at least one of cell culture liquid, bacterial broth, liquid in food, and soil.

[17] A method of concentrating and purifying nucleic acids, the method comprising:

mixing a sample containing a nucleic acid, a compound having a functional group which undergoes dehydration condensation reaction with a carboxyl group included in a substance contained in the sample and a condensing agent of the dehydration condensation reaction; and

electrophoresing the nucleic acid in a polymer gel comprising an anionic functional group having a pKa of from 1 to 5, in which an intercalator having an anionic functional group has been inserted in said nucleic acid.

[18] A cartridge for nucleic acid electrophoresis, comprising:

a channel formed to be capable of introducing a liquid;

a damming portion, which dams substances, disposed at a predetermined position of the channel;

electrodes disposed at both ends of the channel;

an intercalator that can be inserted to a nucleic acid, the intercalator having an anionic functional group;

a compound having a functional group which undergoes dehydration condensation reaction with a carboxyl group;

a condensing agent of the dehydration condensation reaction; and

a buffer;

the compound, the condensing agent, the intercalator and the buffer being housed between the damming portion and a negative-electrode end.

[19] A method of producing a cartridge for nucleic acid electrophoresis, the method comprising:

allowing a monomer solution, introduced in a channel formed on a substrate, to gel into a predetermined shape, by photopolymerization, to form a polymer gel comprising an anionic functional group having a pKa of from 1 to 5; and

housing a compound having a functional group which undergoes dehydration condensation reaction with a carboxyl group, a condensing agent of the dehydration condensation reaction, an intercalator that can be inserted to a nucleic acid, the intercalator having an anionic functional group, and a buffer, into the channel.