

calibration curve indicating a relationship between a current value created in advance and the amount of the analyte. The control unit 17 creates a detection result screen for displaying the information on the estimated amount of the analyte on the display 12. Thereafter, the detection result screen created by the control unit 17 is sent to the display 12 so as to be displayed on the display 12.

[0136] As the electrolytic solution, a solution containing an electrolyte composed of salts which may supply electrons to the labeling substance 93 in an oxidized state, an aprotic polar solvent, a protonic polar solvent, or a mixture of the aprotic polar solvent and the protonic polar solvent can be used. The electrolytic solution may further contain other components, if desired. The electrolytic solution may be in gel or solid form.

[0137] Examples of the electrolyte include iodide, bromide, a metal complex, thiosulfate, sulfite, and a mixture thereof. Specific examples of the electrolyte include metal iodides such as lithium iodide, sodium iodide, potassium iodide, cesium iodide, calcium iodide; iodine salts of quaternary ammonium compounds such as tetraalkylammonium iodide, pyridinium iodide, and imidazolium iodide; metal bromides such as lithium bromide, sodium bromide, potassium bromide, cesium bromide, and calcium bromide; bromine salts of quaternary ammonium compounds such as tetraalkylammonium bromide and pyridinium bromide; metal complexes such as ferrocyanic acid salt and ferricinium ion; thiosulfate salts such as sodium thiosulfate, ammonium thiosulfate, potassium thiosulfate, and calcium thiosulfate; sulfites such as sodium sulfite, potassium sulfite, ammonium sulfite, iron sulfite, sodium bisulfite, and calcium sulfite; and mixtures thereof. Among them, tetrapropylammonium iodide and calcium iodide are preferred.

[0138] The electrolyte concentration of the electrolytic solution is preferably from 0.001 to 15 M.

[0139] Water, a polar solvent containing a buffer component and a main component of water, or the like may be used as the protonic polar solvent.

[0140] Examples of the aprotic polar solvent include nitriles such as acetonitrile (CH_3CN); carbonates such as propylene carbonate and ethylene carbonate; heterocyclic compounds such as 1,3-dimethylimidazolinone, 3-methylloxazolinone and dialkylimidazolium salt; dimethylformamide, dimethyl sulfoxide, and sulfolane. Among the aprotic polar solvents, acetonitrile is preferred. The protonic polar solvent and the aprotic polar solvent can be used alone or mixed for use. As a mixture of the protonic polar solvent and the aprotic polar solvent, a mixture of water and acetonitrile is preferred.

[0141] When the labeling substance 93 is irradiated with light, a light source which can emit light in a wavelength capable of photoexciting the labeling substance 93 can be used. The light source can be suitably selected depending on the type of the labeling substance 93. Examples of the light source include fluorescent lamps, black light, bactericidal lamps, incandescent lamps, low-pressure mercury lamps, high-pressure mercury lamps, xenon lamps, mercury-xenon lamps, halogen lamps, metal halide lamps, light emitting diodes (white LED, blue LED, green LED, and red LED), lasers (carbon dioxide lasers, dye lasers, semiconductor lasers), and sunlight. Among the light sources, fluorescent lamps, incandescent lamps, xenon lamps, halogen lamps, metal halide lamps, light emitting diodes, and sunlight are preferred. In the detection process, the labeling substance 93

may be irradiated with only light in a specified wavelength region, which is obtained using a spectrometer or a bandpass filter, if necessary.

[0142] In the measurement of a photocurrent derived from the labeling substance 93, for example, a measurement device which includes an ammeter, a potentiostat, a recorder, and a computer can be used.

[0143] In the detection process, the amount of the analyte can be examined by quantifying the photocurrent.

[0144] As described above, in the method for electrochemically detecting an analyte according to the first embodiment of the present invention, the polypeptide support 91 is used as the support of the labeling substance. Therefore, according to the method for electrochemically detecting an analyte according to the present embodiment, the photocurrent based on the labeling substance per an analyte S can be increased. On the other hand, in the conventional method for electrochemically detecting an analyte, the polypeptide support 91 is not used. As shown in FIG. 7, when detecting the analyte S, a label binding substance 101 in which a labeling substance 102 directly bound to a binding substance 103 which is bound to the analyte S is generally used. Thus, in the conventional method for electrochemically detecting an analyte, the photocurrent based on the labeling substance per an analyte S is small.

[0145] In the method for electrochemically detecting an analyte according to the present embodiment, from the viewpoint of suppressing the generation of noises due to contaminants, the user may discharge a remaining liquid containing contaminants from the sample inlet 30b of the detection chip 20 after the process of trapping an analyte and wash an inside of the detection chip 20. In the washing of the inside of the detection chip 20, organic solvents such as a buffer (particularly a buffer containing a surfactant); purified water (particularly purified water containing a surfactant); and ethanol can be used.

[0146] In the method for electrochemically detecting an analyte according to the present embodiment, from the viewpoint of removing the label binding substance 90 which is not bound to the analyte S and improving the detection accuracy, the process of washing the inside of the detection chip 20 to remove free label binding substance 90 may be further performed after the labeling process. For example, ethanol and purified water can be used for the washing.

[0147] In the present invention, the operation may be performed so as to form a label binding substance in the labeling process as shown in FIG. 8C in place of labeling the analyte S using the label binding substance to which the labeling substance is bound in advance in the labeling process. In the method for electrochemically detecting an analyte shown in FIG. 8, the process of supplying a sample (FIG. 8A), the process of trapping an analyte (FIG. 8B), and the detection process (FIG. 8D) are the same as the process of supplying a sample (FIG. 6A), the process of trapping an analyte (FIG. 6B), and the detection process (FIG. 6D) in the above method shown in FIG. 6. On the other hand, in the method for electrochemically detecting an analyte shown in FIG. 8, a conjugate 90a retaining the first binding substance 92 and the first linker 94 is bound to the analyte S via the polypeptide support 91 in the labeling process (FIG. 8C) [the process of adding a conjugate (C-1) of FIG. 8C]. Thereafter, the conjugate 90a is bound to a labeled form 90b [the process of adding a labeled form (C-2) of FIG. 8C]. The labeled form 90b is formed of the labeling substance 93, a second linker 96 for retaining the