Device for colorimetric analysis of biomedical fluids comprises reference illumination LEDs, light filters, photodiodes, normalizing amplifiers, a microcontroller, a liquid crystal display and a memory card. Furthermore, it additionally comprises a cell for accommodating a sample under test, two measuring channels and an analog-to-digital converter. Wherein the cell for accommodating a sample under test is optically coupled to the reference illumination LEDs and the measuring channels. Each of the measuring channels comprises separate light filters and photodiodes, outputs of which are connected through normalizing amplifiers to corresponding inputs of the analog-to-digital converter, an output of which is connected to the microcontroller.