

Fig.1 Spectrum of rhodamine B

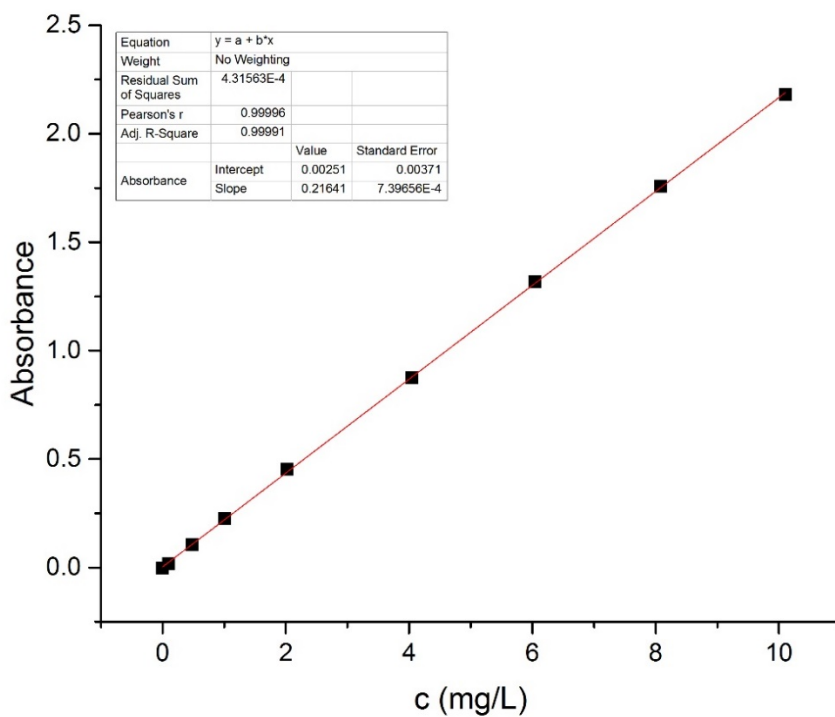


Fig.2 The standard curve of rhodamine B

Image processing method

In order to enhance the visual contrast, we treat the original pictures with deduction of background's grayscale. This image processing method doesn't change the relative brightness of a group of images. For example as shown in Fig. 3, the image before the minus sign is the original picture of a droplet with a gas bubble in it. The bright light of the ring shape is the fluorescence excited by UV. The image after the minus sign is the picture of the background, without any droplet. The background slightly fluoresces because there is rhodamine B in the aqueous phase. Since the droplet and the background both fluoresces, it is not easy to compare the fluorescence intensity between two droplets. So here a subtraction of gray values is done to enhance the visual contrast. The basic rule of this subtraction is as follows. The pictures of the droplet and the background are taken at the same place. Imagine that the two pictures are both composed of countless dots 1, 2, 3,4 Dot i is at the same position of the two pictures. For every dot i , if the gray value in picture a is greater than that in picture b, the gray value of picture a will be maintained to become the dot i 's gray value in picture c. On the contrary, if the gray value of dot i in picture a is smaller than that in picture b, the gray value of picture a will be eliminated and the gray value of dot i in picture c will be 0. And the color of dot i is black. Using the above subtraction, we got a series of pictures that are easily to be compared.

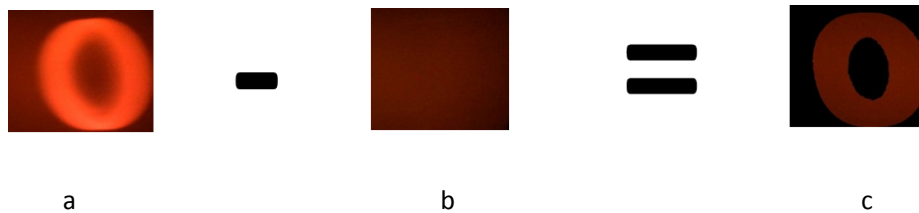


Fig.3 Sketch of deduction of background's grayscale