particle size of MH mainly distribute at range 120nm to 150nm.

Fig.5 shows the test results of Laser particle size analyzer D (90) with different additive amount of PEG6000. PEG6000 is a kind of non-ion surfactants, it possesses low toxicity and environmental characteristics. Usually the ultrafine particles with large specific surface area are easily agglomerateed to big particles. The surfactant can reduce the free energy and stop the surface to gathere together, which restrain the growing up of MH. When the additive amount of PEG6000 is less than 4%(PEG6000%= mPEG6000/m $Mg(NO_3)_2 \cdot 6H_2O$), PEG6000 is adsorbed or wrapped incompletely in MH surface, therefore PEG600 cannot well attain a space resistance function. When the additive amount of PEG6000 is more than 8%, the average sizes of MH get big obviously. In this case, the adsorption quantity of particle surface close to saturation state, and the rest of free PEG6000 will associate with each other, which lead to a certain flocculation and reduce the stability of the system. So it can't form smaller magnesium hydroxide particles when the surfactant is excessive. The additive amount of PEG6000 for 6% is the better choice. At this time, D (90) =208nm, the particle size of MH mainly distribute at range 120nm to 152nm.

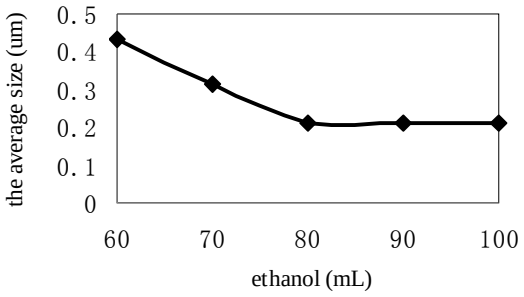

Fig.4. The influence of the amount of ethanol on MH average particle size

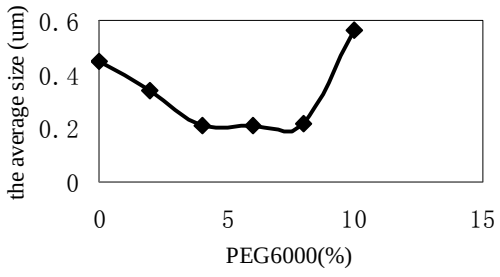

Fig.5. The influence of the amount of PEG6000 on MH average particle size

E. XRD patterns of synthesized $Mg(OH)_2$ samples.

Fig.6 shows the typical XRD patterns of the final products prepared by ethanol and PEG6000 as the dispersing agent. It is noted that the diffraction peaks are strong and sharp when ethanol or PEG6000 was used as the dispersing agent, and indicate that the crystallization of two kinds of samples is good.

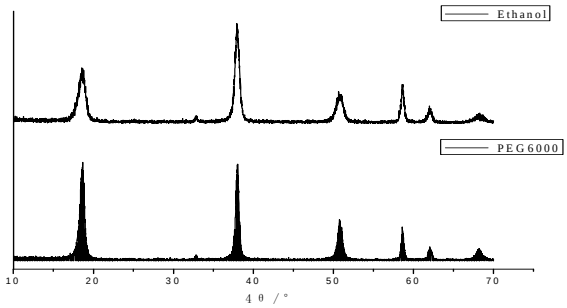

Fig.6. XRD patterns of samples

IV. CONCLUSIONS

Super fine magnesium hydroxide is prepared with two kinds of dispersing agents by direct precipitation method, the optimal parameters: reaction temperature for 30 ℃, solution concentration for 0.1 $mol \cdot L^{-1}$, reaction time for 0.5h, the additive volume of ethanol for 100mL or the additive amount of PEG6000 for 6%. And the XRD patterns of the final products prepared with ethanol or PEG6000 as the dispersing agent shows that the crystallization of two kinds of samples is good. From the point of view of economic and environmental protection, super fine magnesium hydroxide is prepared with PEG6000 as the dispersing agents, which is the better method.

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