

Newmix® - Levtech® Application note

Preparation of an Aluminum Hydroxide Gel Solution with Jet-Drive™

Mixing system: Newmix®- Levtech® Jet-Drive™ system

Mixing bag: 200L A-Mix™ bag

Mixing type: Liquid-liquid

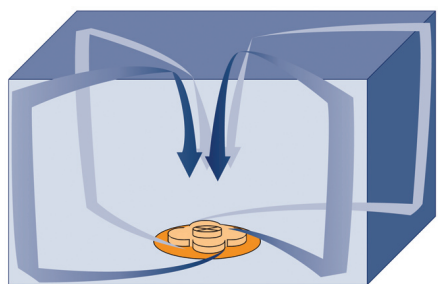
The Newmix-Levtech Jet-Drive system is one of the lightest and most compact disposable mixing systems. It consists of a cubical shaped disposable bag with a magnetically impelled turbine, secured to the bottom of the bag, working as a centrifugal pump.

The established 3D recirculation loop eliminates dead zones and ensures efficient and fast mixing.

Introduction

Liquid-liquid homogenization is a common requirement in biopharma processing, including after storage. Furthermore, a cubical bag shape is generally considered to be preferable from a storage efficiency (footprint) viewpoint. However, performing mixing in a cubical bag can be difficult; some mixing technologies can be prone to uneven distribution within the mixing bag, or can even introduce unwanted particulate contamination. The Jet-Drive impeller was developed to overcome these challenges.

Alhydrogel (aluminum hydroxide gel) is a common pharmaceutical adjuvant. However, maintaining it in a homogeneous aqueous suspension can be challenging because Alhydrogel tends to settle over time. Once settled, the more viscous Alhydrogel lower layer can be difficult to remix. In this experiment, a Jet-Drive mixer was used to prepare a 0.5g/L Alhydrogel-in-saline solution.



A-Mix bag 3-D recirculation loop

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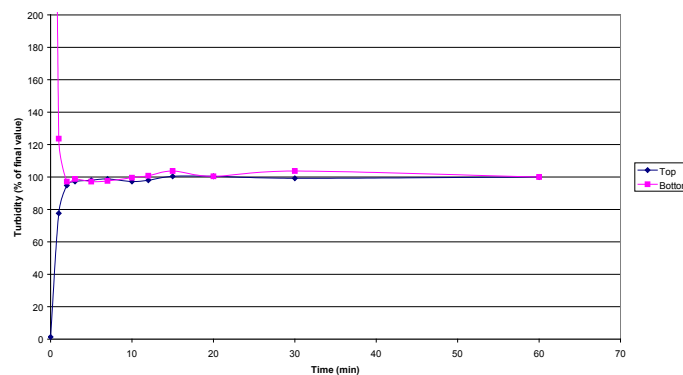
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Experimental

A 200L A-Mix bag was filled with 190L of 150mM sodium chloride solution. The Jet-Drive impeller mixing speed was set at 1000rpm, and 10L Alhydrogel (10gAl/L) was added. Mixing was continued for 15 minutes, and homogeneity verified by turbidity measurements. The mixer was then stopped and the Alhydrogel solution was allowed to settle for 48 hours.

After 48 hours at rest, the mixer was restarted at 1000rpm. Samples of the solution were taken periodically from the top and bottom of the bag during mixing. Solution homogeneity was estimated by performing turbidity measurements on the samples.



Mixing of 0.5mg Al/ml in NaCl 150 mM solution in a 200L A-Mix bag

Results

The accompanying chart shows turbidity readings in the bag during mixing. These results indicate that a very high degree of homogeneity was attained within 3 minutes after restarting the mixer. No foaming was noted during the experiment.

Conclusions

The Newmix-Levtech Jet-Drive system is well suited to mixing and re-mixing of Alhydrogel solution at the concentrations tested.