perfusing fresh culture medium into said vessel and removing spent culture medium from said vessel; and

providing gas to said head space through said port to sweep accumulated CO_2 from the headspace of said vessel, thereby modulating the pH of said cell culture in order to maintain a predetermined pH of said cell.

13-38. (canceled)

39. A method for batch culturing eukaryote cells comprising:

providing cell culture comprising eukaryotic cells in a bicarbonate-containing culture liquid to a vessel,

said vessel having walls that encapsulate said cell culture and a gas phase head space above said cell culture, and wherein said vessel comprises at least one port that provides an entrance and an egress of gas to and from said head space;

agitating said vessel; and

providing gas to said head space through said port wherein said gas contains 8% CO_2 (v/v) of gas during the first day, 5% CO_2 (v/v) of gas the second day and 2% CO_2 (v/v) of gas thereafter.

40. The method of claim **39** wherein said vessel is agitated on a rocker at a rock rate of 21-23 rpm.

41. The method of claim **39** wherein said vessel is agitated on a rocker at a rock angle of 8-12°.

42. The method of claim **41** wherein said vessel is agitated on a rocker at a rock angle of 10°.

43. A method for perfusion culturing eukaryote cells comprising:

providing cell culture comprising eukaryotic cells in a bicarbonate-containing culture liquid to a vessel,

said vessel having walls that encapsulate said cell culture and a gas phase head space above said cell culture, and wherein said vessel comprises at least one port that provides an entrance and an egress of gas to and from said head space;

agitating said vessel;

providing gas to said head space through said port wherein said gas is supplemented with at least 30% O_2 (v/v) two days after initiation of perfusion.

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